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Technical Report Series

Survey of the Benthos of the Lower Kaministiquia River 1985

Technical Report #1
Thunder Bay



NORTH SHORE
OF LAKE SUPERIOR
REMEDIAL ACTION PLANS

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NORTH SHORE OF LAKE SUPERIOR
REMEDIAL ACTION PLAN
TECHNICAL REPORT SERIES

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1. Beak Consultants Limited. 1987. *Survey of the Benthos of the Lower Kaministiquia River, 1985*. Prepared on behalf of the Ministry of the Environment. 114 pp.
2. Cullis, K, W. T. Momot, and R. Sein. 1987. *Kaministiquia River Study, 1987*. Ministry of Natural Resources. 148 pp.
3. Beak Consultants Limited. 1988. *Benthic Community Evaluation of Jackfish Bay, Lake Superior, 1969, 1975, 1987*. Prepared on behalf of the Ministry of the Environment. 208 pp.
4. Pugh, D. 1989. *A Benthos and Substrate Quality Survey of Thunder Bay Harbour in the Vicinity of Northern Wood Preservers, 1972 and 1986*. Ministry of the Environment. 39 pp.
5. Irwin, G.S. 1989. *Bacterial Study of Chippewa Beach -Thunder Bay, Ontario, 1988*. Ministry of the Environment. 40 pp.
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8. Wilson, L. 1990. *Historical Literature Review of the Nipigon Area with Emphasis on Fisheries from 1959 - 1990*. Ministry of Natural Resources.
9. Wilson, L. 1991. *Nipigon Walleye Historical Review*. Ministry of Natural Resources. 94 pp.
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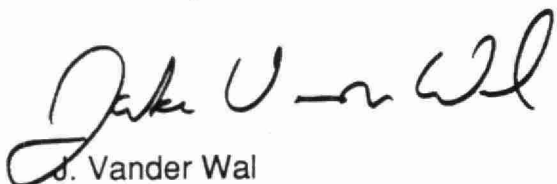
To Whom it May Concern:

The attached report addresses the water quality of the Kaministiquia River, District of Thunder Bay, by examining the nature of the bottom dwelling organisms sampled from the river bottom during surveys conducted over the last 20 years. The earlier surveys indicated that gross pollution of the Lower Kaministiquia River existed as a result of direct discharges of municipal and industrial wastes. These wastes were characteristically high in organic materials causing significant alteration in the nature of the river bottom as well as resulting in severe oxygen depletion in river waters.

More recent surveys, as detailed in the report, indicate the presence of a bottom dwelling community which reflects some improvement in water quality. Nevertheless, the presence of high numbers of tubificid oligochaetes (sludgeworms) demonstrates that significant pollution still exists and that significant additional pollution abatement is required in order to restore the water quality of the Kaministiquia River.

This report forms a part of a technical series on the water quality of northern Lake Superior which is being prepared in support of the Remedial Action Plan program initiated by the International Joint Commission in 1986.

Yours truly,



J. Vander Wal
Coordinator
Thunder Bay Remedial Action Plan

JVW: rmb
Attach:

Canada  Ontario

Canada-Ontario Agreement Respecting Great Lakes Water Quality
L'Accord Canada-Ontario relatif à la qualité de l'eau dans les Grand Lacs



**SURVEY
OF THE BENTHOS
OF THE
LOWER
KAMINISTIKWIA RIVER
1985**

A Report to:

**Ontario Ministry of the Environment
Northwestern Region
and Water Resources Branch**

Prepared by:

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1.0 INTRODUCTION

1.1 Background

The Ontario Water Resources Commission undertook benthic surveys of the Kaministiquia River and Thunder Bay in October 1965 and August 1966 "to reveal the impact of a number of pollution sources on the biota of the lower Kaministiquia River and adjacent Thunder Bay, and to relate these findings to fishing success in these waters" (German, 1967). These surveys showed that tubificid worms accounted for almost all of the benthos in the river between the Great Lakes Paper Company and the river mouth. Tubificid densities reached a maximum of $430,000/\text{m}^2$ ($40,000/\text{ft}^2$), at a location just downstream of Ogilvie Flour Mills (presently Industrial Grain Products Limited). Benthic fauna were found to be absent in 1966 in an area of heavy wood fibre deposition at the mouth of the Mission Channel. The area offshore of the Kaministiquia River extending past the Welcome Islands (about 5 km from the river mouth) showed the effects of organic pollution, with tubificids remaining dominant. The most severely affected area extended lakeward for 1 to 2 km from the river mouth. Benthic sampling locations and survey results in 1965 and 1966 are provided in Appendix 1.

Pugh (1979) surveyed the benthos of the McKellar and Kaministiquia channels of the lower river in July 1975 to provide a background database prior to the development of the Thunder Bay Terminals bulk coal handling facilities on McKellar Island. Results of this survey indicated some improvements in the degree of organic pollution since 1965 and 1966, with lower organism densities (maximum of $115,592/\text{m}^2$) and greater numbers of insects and molluscs, although sludgeworms remained dominant. Benthic sampling locations and survey results in 1975 are provided in Appendix 2.

Beak Consultants Limited (BEAK) surveyed the benthos in the lower Mission Channel and at stations in the bay near the river mouth on several occasions between 1977 and 1985 in a study that documented the effects of the Thunder Bay Generating Station Extension on the aquatic environment (McKee *et al.*, 1987). These surveys showed that the benthos of the lower Mission Channel continued to be characterized by high densities of pollution-tolerant tubificids ($49,000/\text{m}^2$ to $430,000/\text{m}^2$). Benthos in the nearshore lake adjacent to the river mouth were characterized by lower organism densities and greater numbers of taxa, with the polychaete worm Manayunkia speciosa being dominant on some

occasions. Polychaetes were found in the Mission Channel for the first time in 1985, suggesting an improvement in conditions relative to the preceding years. A cluster analysis of the data showed that the benthic community of the lower river was distinct from those in the nearby lake within the river plume area, and that spatial differences in benthic community structure could not be related to the discharge of heated water from the generating station. Sampling station locations and survey results for the 1977-1985 period are provided in Appendix 3.

1.2 Objectives

The Ontario Ministry of the Environment (MOE) carried out an extensive survey of the benthos of the lower Kaministiquia system and river mouth area in the summer of 1985 to document community structure as it relates to water quality and substrate composition, and to assess the degree of change that has occurred since 1965 and 1966 in response to pollution abatement programs implemented by industry and the municipality over the two decades separating the surveys.

BEAK was contracted to identify and enumerate the benthic invertebrates in the samples collected by the MOE, and to compare the results of the 1985 survey with data from the earlier surveys. This report documents the results of this analysis.

2.0 METHODS

2.1 Study Area

The Kaministiquia River originates approximately 64 km northwest of Thunder Bay, and drains a watershed area of about 7,730 km². Twin tributaries collect controlled discharges from Ontario Hydro storage reservoirs and Shebandowan Lake and Dog Lake. From its source, the Kaministiquia River flows southward over Silver Falls, and changes to an easterly course about 4.8 km downstream from Kakabeka Falls. Downstream of Kakabeka Falls, the gradient is lower and the river follows a winding course. The lower 8 km reach from the Westfort Turning Basin to the mouth has been dredged to a nominal depth of 7.6 m for shipping. The average discharge at the furthest downstream point gauged by Environment Canada (Kakabeka Falls) is 53.5 m³/s. Three kilometers from its mouth, the Kaministiquia River divides into three distributaries - the Kaministiquia, the McKellar and the Mission Channels, which carry approximately 40%, 18% and 42% of the total discharge, respectively (Ontario Hydro, 1975). Benthic surveys have concentrated on the lower river from the Westfort Turning Basin and an area immediately upstream, to the area of the mouths of the three distributaries. This lower stretch of the river receives wastewaters from a large pulp and paper complex (discharging to the Westfort Turning Basin), a grain processing facility, and a sewage treatment plant, receives runoff from residential and heavy industrial areas, and is heavily used for commercial shipping and recreational boating.

2.2 Survey Methods

Benthic invertebrates were collected from 23 transects established perpendicular to the river flow from about 1 km upstream of the Westfort Turning Basin, to the dredged channels extending into Thunder Bay from the mouths of the distributaries (Figure 2.1). Two transects (7 and 8) are located upstream from the largest source of organic loadings into the river, and therefore serve as controls for the remaining downstream transects.

Five samples were generally collected from each transect, using a standard Ponar grab that samples an area of 0.05 m² of bottom sediment. Samples 1 and 5 from each transect were taken in the shallow "littoral" zone nearshore (usually 1 to 2 m deep), samples 3 and 4 from the middle of the slope connecting the littoral areas to the channel

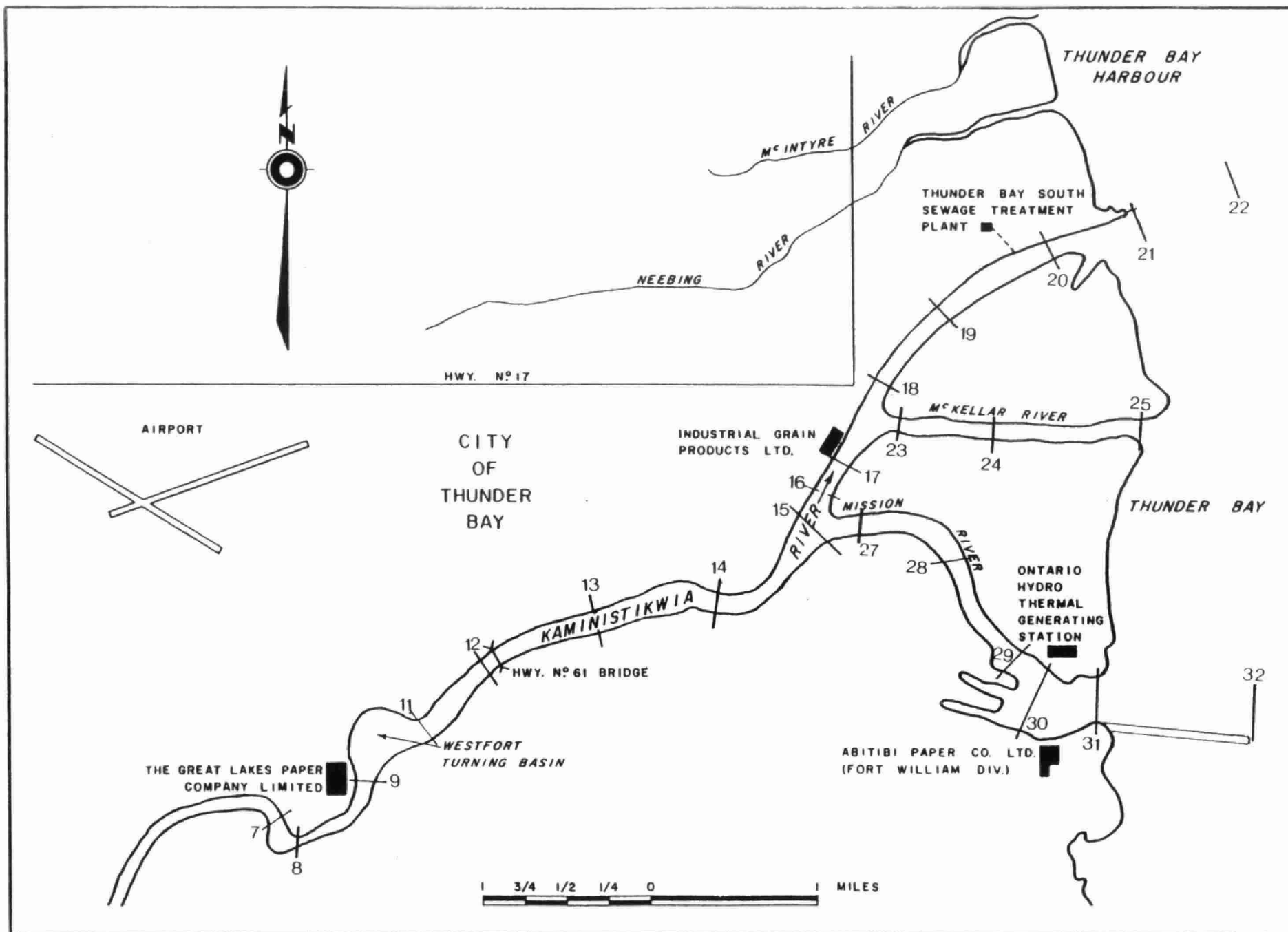


FIGURE 2.1: LOWER KAMINISTIKWIA RIVER STUDY AREA, SHOWING 1985 BENTHIC SURVEY TRANSECTS

bottom (usually 2.5 to 4 m deep), and sample 3 from the channel bottom, which is usually about 8 m deep downstream of the turning basin. Samples 1 to 5 were sampled progressively from the left to the right bank, as seen when facing downstream. Sediments that were sampled consisted primarily of fine silts and very fine sands, although fine to medium sands are found in some areas immediately upstream of the turning basin, at river mouth areas and along the littoral margins of the river. After collection, samples were sieved through a U.S. #30 mesh. Samples were subsequently sorted to remove extraneous coarse debris, and the organisms preserved in 80% ethanol.

Before identification, many of the samples with high numbers of organisms were subsampled by splitting the sample into fractions. Rare groups of organisms (e.g., insects, molluscs and crustacea) in larger samples were sorted from larger fractions of the sample than were the more abundant groups (e.g., oligochaetes). After sorting and subsampling, oligochaetes and chironomids were mounted in CMCP-10 mounting medium on microscope slides. Chironomids were generally decapitated to facilitate clearing of the head capsule. Mounted specimens were allowed to clear over several days before identification. Benthic identifications followed the scheme used by Pennak (1978) except for Mollusca, Oligochaeta and Chironomidae. Mollusc identifications followed Clarke (1973) and Mackie *et al.* (1980), Oligochaeta followed Brinkhurst and Jamieson (1971) and Hiltunen and Klemm (1980), and Chironomidae followed Oliver and Roussel (1983). Samples were identified by two taxonomists. Identifications were cross-checked to ensure agreement in the taxonomy. All samples were enumerated by species, and densities expressed on a whole sample basis.

Several indexes were calculated from the benthic data, including the number of taxa, total density, species diversity using the Shannon formula, species richness and evenness.

Diversity

$$H' = -\sum (n_i/n) \log_2 (n_i/n)$$

where: n = total number of individuals collected in the sample

n_i = number of individuals in the i th species

Species Richness

$$SR = (S-1)/\ln n$$

where: S = number of species

Evenness

$$J' = H'/\log S$$

For diversity, richness and evenness calculations, immature capilliform and non-capilliform tubificids were assigned to the corresponding capilliform and non-capilliform adults in proportion to the numbers of each species represented in the adult assemblage. If no adults were present, immatures were assumed to belong to one species. Also, chironomid pupae were treated as a distinct species.

3.0 RESULTS AND DISCUSSION

3.1 1985 Results

A detailed listing of species, densities, diversities, richness and evenness for each sample is provided in Table 1 of Appendix 4. A summary of data by transect is provided in Table 3.1.

The distribution and species composition of benthic communities in 1985 varied considerably within transects. On most transects, the highest diversities occurred at littoral stations, probably due to the habitat diversity provided by rooted aquatic plants in many of these areas. These locations also usually had the highest numbers of taxa and species richness within most transects. The highest densities typically occurred either on the channel slopes or on the channel bottom. These patterns were less evident upstream of the turning basin where the river is not dredged, and at river mouth areas and beyond where the "littoral" locations are somewhat deeper and lack rooted aquatic plant growth. At some transects, however, the deeper locations had relatively low densities of organisms, apparently due to the effects of dredging and disturbance of the sediments by passing ship traffic.

At Transects 7 and 8 upstream of major sources of industrial loadings, benthic densities were low at most locations (generally $4,000/\text{m}^2$ or less), with no strong predominance of any group. Commonly encountered species included some which are generally intolerant of heavy organic pollution. Notable among these is the mayfly Hexagenia, which may become eliminated or greatly reduced in numbers in areas that become eutrophic, as observed in western Lake Erie (Cook and Johnson, 1974), and in waters contaminated by oil and grease (Hiltunen and Schloesser, 1983), as may occur downstream in the Kaministiquia River due to shipping, boating and industrial runoff. The polychaete Manayunkia speciosa, while considered indicative of organic enrichment when abundant (Cook and Johnson, 1974; Poe and Stephan, 1975), is intolerant of heavy organic pollution and depleted dissolved oxygen levels (Mackie and Qadri, 1971). The tubificid Aulodrilus, a genus considered indicative of mesotrophy rather than eutrophy in the Great Lakes (Cook and Johnson, 1974), was also common at Transects 7 and 8. One location on Transect 7 supported very high densities of tubificids ($153,000/\text{m}^2$), consisting primarily of pollution-tolerant Limnodrilus spp., indicating that areas of organic enrichment also

TABLE 3.1: SUMMARY STATISTICS ON THE 1985 BENTHIC COMMUNITY IN THE LOWER KAMINISTIKWIA RIVER

Transect	Density (No/m ²)	No. Taxa	Diversity	Richness	Evenness
7	60-153,000	3-18	0.47-2.92	0.34-3.85	0.24-1.00
8	40-680	2-11	1.0-3.2	1.44-3.19	0.90-1.00
9	22,300-86,500	3-8	0.25-1.93	0.25-0.90	0.16-0.74
11	33,900-376,000	2-8	0.77-1.65	0.11-0.94	0.45-0.98
12	360-105,000	2-8	0.8-2.50	0.12-2.08	0.31-0.99
13	1,400-118,000	3-8	0.56-2.38	0.23-1.65	0.20-0.79
14	1,040-94,080	3-10	0.81-2.47	0.25-2.28	0.43-0.82
15	2,080-35,700	2-11	0.65-2.50	0.27-2.37	0.47-0.72
16	4,960-1,120,000	2-10	0.49-1.59	0.20-1.81	0.24-0.68
17	4,700-532,000	2-17	0.30-3.08	0.21-3.11	0.30-0.75
18	12,100-338,000	2-17	0.39-3.01	0.21-2.65	0.24-0.74
19	19,200-169,000	4-11	0.35-1.85	0.44-1.60	0.17-0.51
20	6,580-55,400	5-17	1.37-3.2	0.65-2.80	0.39-0.78
21	260-7,740	4-13	1.54-2.79	1.34-2.68	0.51-0.99
22	20-6,640	1-10	0-3.57	*-3.91	*-0.87
23	7,900-82,000	5-18	0.58-2.22	0.66-2.48	0.25-0.62
24	460-28,100	2-13	0.33-2.52	0.32-2.55	0.21-0.84
25	620-29,900	9-15	1.88-2.98	1.84-3.20	0.48-0.86
27	28,020-174,000	3-13	0.42-1.34	0.33-1.79	0.26-0.58
28	1,520-60,500	4-14	0.42-2.87	0.62-3.23	0.18-0.75
29	1,140-14,400	3-8	0.67-2.68	0.64-1.98	0.42-0.89
30	0-990	0-8	*-2.33	*-2.22	*-0.90
31	160-9,080	4-12	1.75-2.38	1.61-2.14	0.61-0.88
32	60-5,140	3-13	1.58-3.15	1.32-3.16	0.58-1.00

* Undefined values resulting from zero counts or division by zero.

occur upstream of the major industrial sources. This high density may be associated with a zone of organic deposition.

The benthic assemblage at Transect 9 consisted almost entirely of high densities of Limnodrilus spp. and Tubifex tubifex, indicating heavy organic enrichment. This transect is immediately downstream from a diffuser carrying effluent from the pulp and paper complex, and the benthic community reflects the effects of organic enrichment from this source. Variations in the community across the transect were small, suggesting relatively complete dispersion across the river by the diffuser.

Transect 11 supported extremely high densities (greater than $200,000/\text{m}^2$) at four of the five stations sampled, with nearly all of the organisms consisting of a pollution-tolerant Limnodrilus-T. tubifex assemblage. These densities are similar to or greater than the tubificid densities reported in the most polluted sections of Toronto Harbour in 1969 (Brinkhurst, 1970). (Densities have subsequently fallen in Toronto Harbour, reflecting improvements in environmental conditions (BEAK *et al.*, 1987).) The extreme densities of tubificids found at Transect 11 can be attributed primarily to the organic loadings discharged to the turning basin immediately upstream. Reduced tubificid densities and the presence of low numbers of sensitive forms such as Hexagenia and caddisflies at one littoral station probably reflect local effects of a shoreline plant community, higher oxygen levels due to wave wash near the shoreline, and perhaps a greater degree of effluent dilution.

Transects 12 to 15, located between Transect 11 and the beginning of the Mission Channel, were dominated by tubificids, primarily Limnodrilus spp., but tended to support lower densities of T. tubifex, and greater numbers of other taxa including naidids, insects, and the tubificid Aulodrilus pluriseta, a species that was absent from the most polluted areas of Toronto Harbour in 1969 (Brinkhurst, 1970). The increase in diversities, the greater numbers of more sensitive taxa, the reduction in T. tubifex densities, and a general decrease in total densities to less than $120,000/\text{m}^2$ reflect some degree of recovery between Transect 11 and Transects 12 to 15.

Benthic densities at Transects 16 and 17 show a considerable increase relative to those observed at the three transects immediately upstream. Densities at Transects 16 and 17 reached $1,120,000/\text{m}^2$ and $532,000/\text{m}^2$, respectively - densities which, to our knowledge,

exceed any others reported in the Great Lakes basin. The assemblage at four of the five locations on each transect consisted almost exclusively of Limnodrilus spp., T. tubifex and Spirosperma ferox, with substantial numbers of any other groups occurring only at the littoral stations located near the east river bank. These locations are influenced by organic loadings from a grain processing facility which discharges an organic-rich effluent near the west bank in the vicinity of Transect 16.

Tubificid densities generally declined with distance downstream of Transect 17 in the Kaministiquia River, with maximum total densities falling from 338,000/m² at Transect 18 to 169,000/m² at Transect 19, 55,400/m² at Transect 20, 7,740/m² at Transect 21 and 6,640/m² at Transect 22. Benthos at the channel bottom and on the channel slopes of Transects 18 and 19 remained dominated by Limnodrilus spp., T. tubifex and S. ferox, with chironomids (particularly Procladius) appearing in greater numbers at Transect 19 than found at the most impacted locations on Transects 16 and 17. As observed at Transects 16 and 17, one littoral station on each of Transects 18 and 19 supported lower total densities and greater diversities than other locations on the same transects, probably due to a greater habitat diversity provided by plant growth along the river bank. Transects 20 to 22 demonstrate the increasing effect of dilution by relatively unpolluted lake water, with tolerant tubificids declining in relative and absolute abundance, and less tolerant forms such as Stylodrilus heringianus and Monodiamesa, which are classified by Cook and Johnson (1974) as oligotrophic forms, M. speciosa, and several other arthropods and molluscs increasing in abundance with distance in the lakeward direction. The benthic community shows no apparent response due to sewage effluents at Transect 20, probably due to effective sewage treatment and ample dispersion in the area. The paucity of benthos in Sample 2 from Transect 22 probably reflects the effects of bottom scour by marine traffic, dredging, or habitat deficiency.

The benthic communities found at Transects 23, 24 and 25 in the McKellar Channel also tend to show a decrease in densities with downstream distance, although maximum densities of 82,000/m², 28,100/m² and 29,900/m² at Transects 23, 24 and 25, respectively, are somewhat reduced relative to densities at comparable transects (18, 19 and 20) in the Kaministiquia Channel. This lower density may be attributed in part to a greater flow of the grain processing effluent down the Kaministiquia Channel than down the McKellar Channel, due to incomplete mixing of the effluent across the river before the beginning of the McKellar Channel. Transect 23 was dominated by T. tubifex,

Limnodrilus spp. and S. ferox, while these groups declined in abundance at Transect 24, and then increased to some degree at Transect 25, with the latter transect also supporting a greater number of taxa and greater diversities than found at mid-channel and channel slope locations at the two upstream transects. Again, littoral areas tended to support lower densities and greater diversities than other areas. The benthic community at the mouth of the McKellar Channel demonstrates the effects of dilution by lake water and reduced environmental stress on the benthic community, as observed at the Kaministiquia Channel mouth.

The benthos of the Mission Channel, like that of the Kaministiquia and McKellar Channels, shows a downstream gradient from assemblages characterized by very high densities of pollution-tolerant tubificids (Limnodrilus spp. and T. tubifex in the upstream area (Transect 27)), to assemblages of lower numbers of tolerant forms and greater numbers of more sensitive forms, such as S. heringianus and various molluscs and arthropods, at the river mouth and beyond. The maximum total densities of $174,000/\text{m}^2$ at Transect 27 was considerably greater than the maximum densities of $60,500/\text{m}^2$ at Transect 28 and $990/\text{m}^2$ to $14,400/\text{m}^2$ at Transects 29 to 32. Local commercial ship traffic is concentrated in the lower Mission Channel, and disturbance of the sediments may exert a greater influence on the benthos in this area relative to other areas in the lower river basin. The area showing the lowest densities (Transect 30) may be subject to the greatest ship disturbance, since this is an area where large vessels are manoeuvred into a major grain elevator facility. The outermost transect (32) supported a community that was generally similar to the community found offshore of the Kaministiquia Channel (Transect 22), although polychaetes were common at Transect 22 and absent at Transect 32, while S. heringianus was more common at the latter transect.

The occurrence of the naidid Ripistes parasitica in littoral areas on Transects 17, 18 and 24 is of special interest. Hiltunen and Klemm (1980) included this species in their naidid key since it was suspected to be present, but had not been confirmed (Barton and Griffiths, 1984). This species occurs widely in association with aquatic plants in Europe and the U.S.S.R. (Juget, 1980), and may have been introduced to the Great Lakes in ballast water from ships engaged in international trade (Barton and Hynes, 1984). This species has been observed previously in Thunder Bay, in the North Channel (Barton and Hynes, 1984) and in the St. Marys River in a study being completed for the Ministry of the Environment by Beak Consultants Limited.

3.2 Temporal Comparisons

The benthic communities of the lower Kaministiquia River were surveyed in four studies over the 1965 to 1985 period, permitting an examination of long-term trends in the community, as well as an evaluation of changes in the pollution status of the river. Some variations in sampling methods among these studies tend to reduce the validity of direct comparisons. In all studies, benthos was collected by bottom grab (Ekman in 1965/66, Ponar in other studies), and was sieved with a U.S. #30 mesh screen. German (1967) did not indicate the habitat sampled in his report, but by inference, these earliest samples were collected from either the channel slopes or the channel bottom. Pugh (1979) analyzed pooled samples consisting of four samples from the littoral zone (1 to 2 m deep), three from the channel slopes (2.5 to 4 m deep), and three from the channel bottom (at least 6 m deep) from each river station. BEAK (1987) collected benthic samples consisting of three to four grabs each from the north channel slope in the lower Mission Channel. Only in BEAK's study were samples collected with replication (triplicate samples) at individual locations. The 1985 survey reported herein is most comparable to the 1975 study in field methodology, although the relative effort expended in sampling littoral, channel slope and channel bottom habitats differed between the two studies. However, the spatial extent of the 1985 study was more comparable to the 1965/66 study, since both covered the area from upstream of the turning basin to the mouths of the distributaries. The 1975 study was confined to the McKellar Channel and the Kaministiquia Channel downstream of the junction with the Mission River.

In BEAK's studies, it was found that 95% confidence intervals for geometric mean densities at individual stations during single surveys were large, with maximum values typically in the order of five and sometimes ten times greater than the minimum. This considerable variation in benthic densities at individual locations indicates that large differences in densities among stations are required to demonstrate statistically significant differences.

Despite the differences in approach between the various studies that have been carried out, the relatively large size of the available database permits some general observations on long-term trends. To facilitate this comparison, Table 3.2 provides a summary of statistics on benthic communities sampled at approximately the same locations in two or more surveys.

TABLE 3.2: COMPARISONS OF BENTHIC COMMUNITIES OVER TIME AT LOCATIONS SAMPLED IN MORE THAN ONE STUDY IN THE KAMINISTIKWIA RIVER, 1965-1985

Transect	1985			Station	1977-85 (BEAK, 1986)			Station	1975 (Pugh, 1975)			Station	1965-66 (German, 1967)		
	Density (No/m ²)	% Olig.	No. of Taxa**		Density (No/m ²)	% Olig.	No. of Taxa		Density (No/m ²)	% Olig.	No. of Taxa		Density (No/m ²)	% Olig.	No. of Taxa
7	60-153,000	0-99.97	15									KD	75	0	0-2
9	22,300-86,500	97.8-100	4									KE	75-5,900	0-100	1
12	360-105,000	16.7-100	5									KF	1,790-20,600	96.4-99.2	4-5
15	2,080-35,700	93.3-100	7									KG	124,000-215,000	100	1
16	4,960-1,120,000	97.2-100	5					1	115,592	99.5	4				
17	4,700-532,000	59.6-100	7												
18	12,100-338,000	67.8-100	7					2	49,938	*	3	KH	8,300-430,000	100	1
19	19,200-169,000	98.2-100	7					3	38,729	99.4	4				
20	6,580-55,400	84.6-99.9	10					4	1,456	88.0	9	KI	7,400-14,000	98.1-99.7	1-5
22	20-6,640	0-93.7	13					5	2,763	94.3	7				
23	7,900-82,000	86.1-99.9	14					10	8,013	99.5	7				
24	460-29,900	60.9-100	9					9	9,416	99.1	4				
25	620-29,900	61.3-96.2	12					8	139.3	55.8	9	KJ	5,390-124,000	100	1
28	1,520-60,500	90.8-100	7	6	49,000-363,000	≤ 99	1-5								
29	1,140-14,400	64.9-100	4	5	54,000-305,000	≤ 99	4-6								
30	0-990	0-97.8	6									KK	0-230,000	0-100	1

* Error in data as reported.

** Based on all locations on each transect and a taxonomy level equivalent to the levels provided in 1965-66 and 1975 (oligochaetes, chironomids, Musculium each represent one taxa).

In general, benthic communities in the river downstream of major effluent sources have consisted mainly of high densities of pollution-tolerant tubificids over the two decades spanned by these surveys. There are some differences in total densities reported at individual locations in the various surveys, but these have varied inconsistently over time so that no general long-term trend is apparent. Total densities reported by BEAK over several years including 1985 on the channel slope at Transect 29 (BEAK's Station 5) were consistently higher than observed in samples collected in this study (54,000 to 305,000 vs. 1,140 to 14,400), suggesting that there may be considerable variation in results between survey crews or sample sorters, or that minor variations in sampling locations among surveys may have a large effect on the results obtained. In terms of total densities, the most notable change observed over the past 20 years is the elimination of major wood fibre deposits that resulted in the complete absence of a macrobenthic community at the Mission River mouth in 1966 (Station KK, in German, 1967). In extensive environmental surveys of the Mission Channel mouth area between 1977 and 1985, BEAK field crews did not encounter this condition. As noted previously, the absence of a benthic fauna in one of the samples collected at Transect 30 in 1985 is probably attributed to habitat limitations or bottom disturbance by shipping. One condition that has been constant over the survey period is the occurrence of the highest densities of sludgeworms at locations most affected by the discharge from the grain processing plant, in spite of the installation of an anaerobic effluent treatment system in the early 1980's.

While sludgeworm densities have not changed substantially over time in the lower Kaministiquia system, some improvements in environmental conditions are indicated by the appearance of greater numbers of more pollution-sensitive benthic taxa since 1965. At all locations sampled in 1985 and in at least one earlier survey, the numbers of taxa have increased over time (Table 3.2). These trends are most evident in the three distributaries, particularly in river mouth areas. These improvements can probably be attributed to reductions in organic loadings in the lower river that have been achieved in more recent years.

Other more subtle improvements in water quality conditions are indicated by changes in the composition of oligochaete assemblages. German (1967) found only Limnodrilus hoffmeisteri and T. tubifex downstream of the grain processing plant, and four species at the mouth of the McKellar Channel (L. hoffmeisteri, T. tubifex, L. cervix and Quistadrilus (Peloscolex) multisetosus). In 1985, five tubificid species were encountered

in the area of the grain processing plant (Transects 16 and 17), including L. hoffmeisteri, L. cervix, Limnodrilus udekemianus, T. tubifex and S. ferox. Several naeid oligochaete species were also present in littoral areas in 1985. At the McKellar Channel mouth (Transect 25), the number of tubificid species encountered increased to seven in 1985, including the five species found at Transects 16 and 17, as well as Tubifex ignotus and the more sensitive A. pluriseta. Also, the relatively sensitive lumbriculid oligochaete S. heringianus and some naeids were found in the oligochaete fauna at the mouth of the McKellar in 1985.

4.0 CONCLUSIONS

The benthic communities of the lower Kaministiquia River are characterized by high total densities and a large tubificid component. Densities of tubificids rise immediately downstream of sites receiving organic industrial wastes at the Westfort Turning Basin and at the grain processing facility downstream of the junction with the Mission Channel. Tubificid densities at some locations in the latter area appear to be the highest known in the Great Lakes Basin (over $1,000,000/m^2$). Densities fall and benthic diversities and numbers of taxa generally increase with increasing distance downstream from these sources, indicating some recovery before the river empties into Thunder Bay. No effect of the sewage treatment plant is apparent in the downstream benthos.

More sensitive organisms such as polychaete and lumbriculid worms, and certain species of tubificids and arthropods, tend to be confined to areas upstream of the Westfort Turning Basin and near the river mouth where lake water provides dilution. Sensitive species are also found in littoral areas along most of the length of the river, apparently due to the presence of a more diverse habitat with aquatic plants, and possibly due to improved circulation and aeration relative to deeper areas.

Benthic communities have demonstrated some improvements in environmental conditions over the past 20 years, apparently due to the implementation of pollution abatement programs in the lower river. The heavy deposits of wood fibre that eliminated macrobenthic life in some areas in the mid-1960's have not recurred, and greater numbers of taxa including forms less tolerant of organic pollution have returned to the lower river. In spite of these improvements, the lower Kaministiquia River continues to support a community that reflects very heavy loadings of organic materials from local sources.

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APPENDIX 1

1965/66 Benthic Survey Locations
and Results
(from German, 1967)

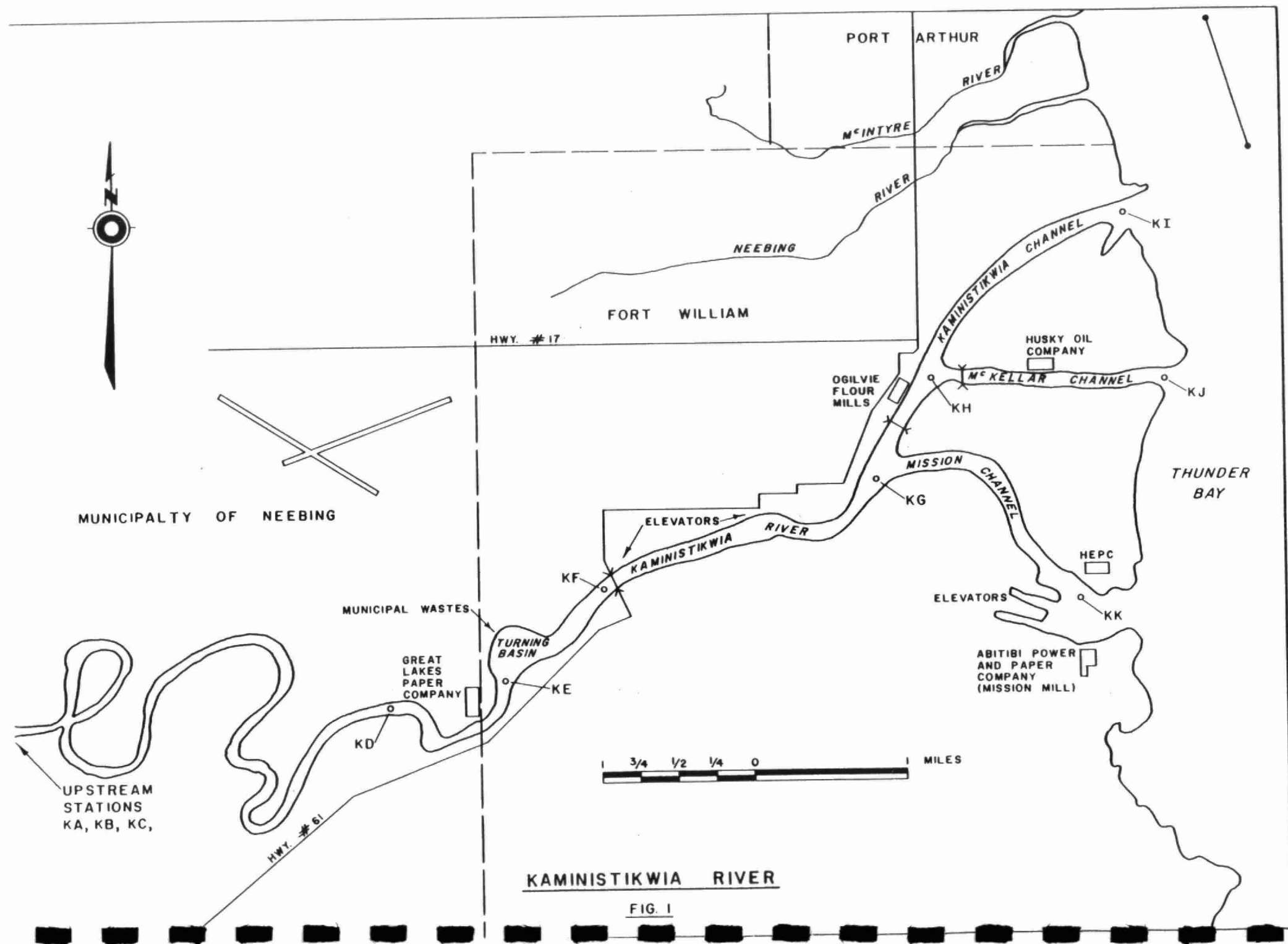


Table 1. Macroinvertebrates collected at 11 stations on the Kaministiquia River in October of 1965 and August, 1966. Collecting methods are outlined in the text of the report.

[illegible]

Table 1. - continued

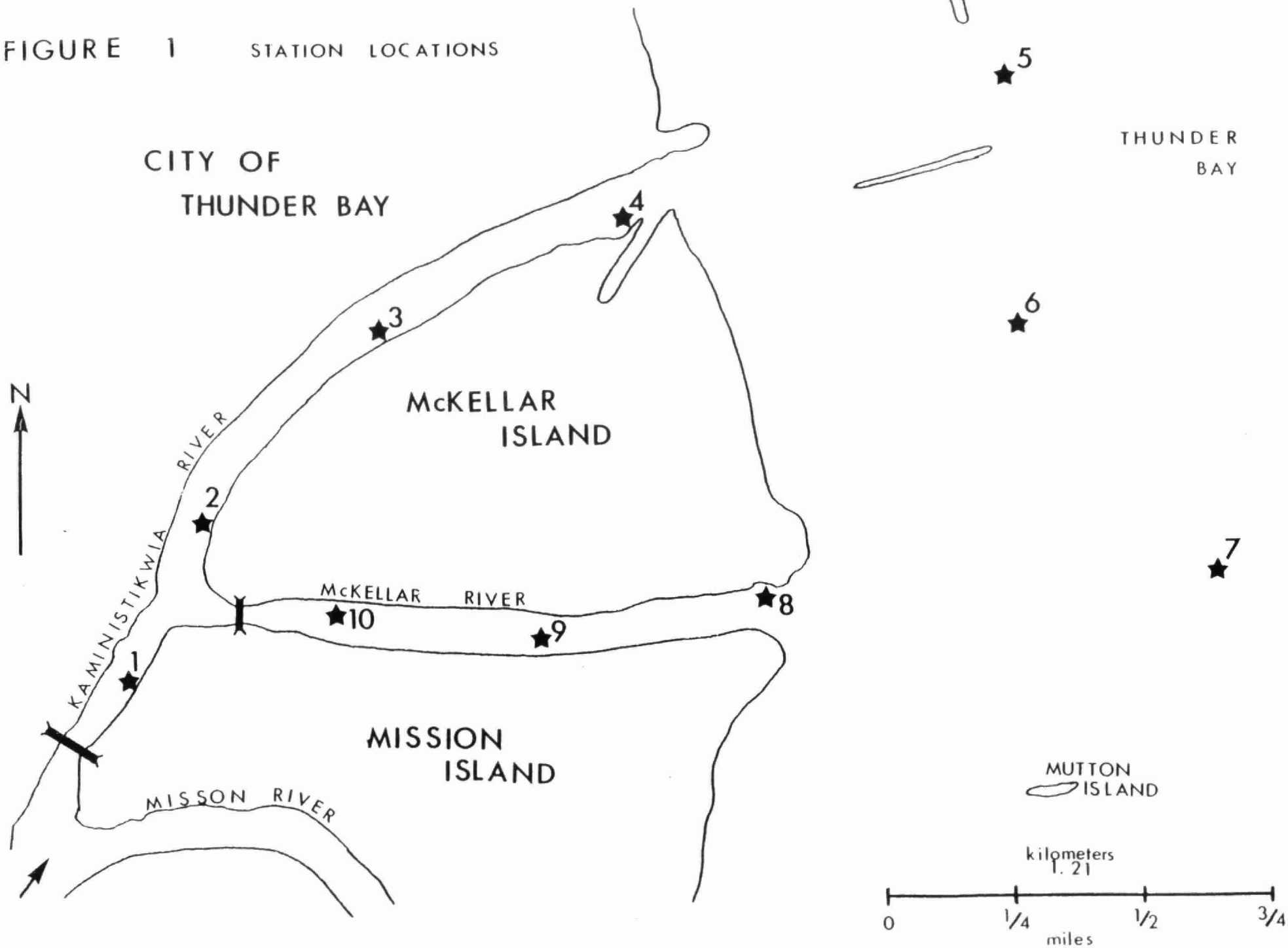
		STATIONS											
Taxa	Date	Qualitative*			Qualitative and Quantitative							KJ	KK
		KA	KB	KC	KD	KE	KF	KG	KH	KI			
LEECHES													
<u>Dina</u>	1965									2			
	1966	2											
MIDGES													
Chironomidae	1965				2	7	2						
	1966	1					7						
FLIES													
<u>Palpomyia</u>	1965				5								
	1966												
WORMS													
Oligochaeta	1965					160	11,500	775	675	11,500	21,500		
	1966					550	1900	20,000	40,000	1300	500		

*Qualitative - stations KA, KB and KC were sampled only in 1966 (see section on methods).

APPENDIX 2

1975 Benthic Survey Locations
and Results
(from Pugh, 1979)

FIGURE 1 STATION LOCATIONS



APPENDIX I. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministikwia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 1										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
TRICHOPTERA Sp.															
DIPTERA Tendipedidae		1	14		5							20	2.0	4.5	37.9
ACARI (MITES) Sp.															
ISOPODA Asellus															
AMPHOPODA Gammarus Crangonyx															
TURBELLARIA Sp.															
OLIGOCHAETA Sp.		744	72	1176	81	10950	7500	8578	6800	14140	10500	60541	6054	5181	115534
HIRUDINEA Erpobdella Helobdella															
GASTROPODA Physa Valvata sincera <u>V. tricarinata</u>					2							2	.2	.6	3.8
PELECYPODA Sphaerium Pisidium		2										2	.2	.6	3.8
Total Taxa		3	2	1	3	1	1	1	1	1	1	4	1.5	.9	-
Total individuals		747	86	1176	88	10950	7500	8478	6800	14140	10500	60565	6057	5178	115592
Sample depth in metres		1.5	1.5	1.0	1.0	6.5	6.5	6.5	7.0	7.0	7.0	-	4.6	2.9	-

APPENDIX II. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministikwia and McKellar Rivers, July, 1975.

Sample	STATION 2										Total per Station	Mean per Sample	σ	Total per sq.m.
	1	2	3	4	5	6	7	8	9	10				
DIPTERA														
Tendipedidae	29	3	15	3							50	6.3	10.5	119.3
(MITES)														
Sp.														
ISOPODA														
Asellus														
AMPHIPODA														
Gammarus														
Crangonyx														
MOLLUSCA														
Sp.														
POLYCHAETA														
Sp.	204	192	1184	460	861	4200		7000		6780	26101	2616.0	2941.0	56123
TUBIFICIDAE														
Erpobdella														
Helobdella														
GASTROPODA														
Physa	2			1							3	.4	.7	7.2
Valvata sincera														
V. tricarinata														
PELECYPODA														
Sphaerium														
Pisidium														
Total Taxa	3	2	2	3	1	1		1		1	3	1.8	.9	-
Total individuals	235	195	1199	464	861	4200		7000		6780	26154	2616.0	2935.0	49938
Sample depth in metres	1.0	1.0	1.0	1.0	6.0	5.0	6.0	7.0	6.5	7.0	-	4.2	2.8	-

APPENDIX III. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Sample	STATION 3										Total per Station	Mean per Sample	σ	Total per sq.m.
	1	2	3	4	5	6	7	8	9	10				
INSECTA														
Diptera														
Dendipediidae		76	1	7	1	2					87	8.7	23.7	164.8
Mites (MITES)														
Sp.														
Isopoda														
Asellus														
Amphipoda														
Gammarus														
Crangonyx														
Mollusca														
Sp.														
Ligochaeta														
Sp.	315	180	303	190	252	130	315	3500	6500	8500	20185	2019	3099	38521
Turbellaria														
Erpobdella														
Helobdella														
Astropoda														
Physa		17									17	1.7	5.4	32.2
Valvata sincera														
V. tricarinata														
Elecypoda														
Sphaerium		1				4					5	.5	1.3	9.5
Pisidium														
Total Taxa	1	4	2	2	2	3	1	1	1	1	4	1.8	1.0	-
Total individuals	315	274	304	197	253	136	315	3500	6500	8500	20294	2029	3092	38729
Sample depth in metres	1.0	1.0	1.0	1.0	6.0	6.0	6.0	8.0	8.0	8.0	-	4.6	3.2	-

APPENDIX IV. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 4										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
TRICHOPTERA Sp.															
DIPTERA Tendipedidae		1			1	3	3	3	2	26	9	48	4.8	7.9	90.9
ACARI (MITES) Sp.															
ISOPODA Asellus		1				1		5	2		1	10	1.0	1.6	18.9
AMPHIPODA Gammarus								1			1	2	.2	.4	3.8
Crangonyx						3		1			3	7	.7	1.3	13.3
HYDROPHORIDAE Sp.											1	1	.1	.3	1.9
OLIGOCHAETA Sp.		3	4	5	6	7	31	4	205	396	16	677	67.7	13.1	1282.0
HIRUDINEA Erpobdella Helobdella															
GASTROPODA Physa										4		4	.4	1.3	7.6
Valvata sincera V. tricarinata															
ELECYPODA Sphaerium							1	1	1	3		6	.6	1.0	11.4
Pisidium										4	4	8	.8	1.7	15.2
Total Taxa		3	1	1	2	4	3	6	4	5	7	9	3.6	2.0	-
Total individuals		5	4	5	7	14	35	15	210	433	35	763	76.3	14.0	1456.0
Sample depth in metres		1.5	1.5	1.5	1.5	3.0	3.0	3.0	5.0	5.0	5.0	-	3.0	1.5	-

APPENDIX V. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 5										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
TRICHOPTERA Sp.															
DIPTERA Tendipedidae		11	7	3	3	12	3	1		7	1	48	4.8	4.2	90.0
ACARI (MITES) Sp.															
ISOPODA Asellus						1						1	.1	.3	1.9
AMPHIPODA Gammarus Crangonyx															
TURBELLARIA Sp.															
OLIGOCHAETA Sp.		972	81	52	16	67	63	37	2	61	14	1365	136.5	295.0	2605.0
HIRUDINEA Erpobdella Helobdella		1										1	.1	.3	1.9
GASTROPODA Physa Valvata sincera <u>V. tricarinata</u>											1	1	.1	.3	1.9
PELECYPODA Sphaerium Pisidium		6 6	4 5			1 1	1 1	1 1	1 4	2 4		16 16	1.6 1.6	2.0 2.4	30.3 30.3
Total Taxa		5	4	2	2	4	3	3	3	4	3	7	3.3	1.0	-
Total individuals		996	97	55	19	81	67	39	4	74	16	1448	145.	301.0	2763.0
Sample depth in metres		5.0	5.0	5.0	4.5	5.0	5.0	5.0	4.5	4.0	4.0	-	4.7	.4	-

APPENDIX VI. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 6										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
COLEOPTERA Sp.															
COLEOPTERA Tendipedidae			2	1	5	13	7	6	5	5	3	47	4.7	3.7	89.0
COLEOPTERA (MITES) Sp.															
COLEOPTERA Asellus															
COLEOPTERA Gammarus Orangonyx								1				1	.1	.3	1.9
COLEOPTERA Sp.															
COLEOPTERA Sp.		1	55	4	3	36	13	1	46	19	7	185	18.5	20.1	350.4
COLEOPTERA Erpobdella Helobdella															
COLEOPTERA Physa Valvata sincera V. tricarinata			1									1	.1	.3	1.9
COLEOPTERA Sphaerium Pisidium			3		1		1					4 1	.4 .1	1.0 .3	18.9 1.9
Total Taxa		1	4	2	2	2	3	3	2	2	2	6	2.4	.8	-
Total individuals		1	61	5	9	49	21	8	51	24	10	239	23.9	22.0	456.1
Sample depth in metres		5.0	4.0	3.5	3.5	2.5	2.0	1.0	.5	.5	.5	-	2.3	1.7	-

APPENDIX VII. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 7										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
DIPTERA															
Sp.															
DIPTERA															
Tendipedidae		10	7	5	2	8	7		4	8		51	5.1	3.5	96.6
MACRIDI (MITES)															
Sp.															
ISOPODA															
Asellus					1				1			2	.2	.4	3.8
AMPHIPODA															
Gammarus															
Crangonyx															
RELLARIA															
Sp.															
GOCHAETA															
Sp.		57	25	55	48	28	29	22	84	38		386	38.6	23.4	731.0
CRUDINEA															
Erpobdella															
Helobdella															
ASTROPODA															
Physa												3	.3	1.0	5.7
Valvata sincera						3						4	.4	.7	7.6
V. tricarinata				2	1				1						
PELECYPODA															
Sphaerium		5				2	1			3		11	1.1	1.7	20.8
Pisidium				1								1	.1	.3	1.9
Total Taxa		3	2	4	4	4	3	1	4	3	0	7	2.8	1.4	-
Total individuals		72	32	63	52	41	37	22	90	49	0	458	45.8	25.7	874.0
Sample depth in metres		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-	5.0	0	-

APPENDIX VIII. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 8										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
TRICHOPTERA Sp.							1					1	.1	.3	1.9
DIPTERA Tendipedidae					3		1	1			1	6	.6	1.0	11.4
ACARI (MITES) Sp.		1										1	.1	.3	1.9
ISOPODA Asellus							3	4	4			11	1.1	1.8	20.8
AMPHIPODA Gammarus Crangonyx				1			1	2				4	.4	.7	7.6
TURBELLARIA Sp.							1	2				3	.3	.7	5.7
OLIGOCHAETA Sp.		8	2	3	1	1	16	3	3		4	41	4.1	4.7	77.7
HIRUDINEA Erpobdella Helobdella															
GASTROPODA Physa Valvata sincera <u>V. tricarinata</u>															
PELECYPODA Spaherium Pisidium							1 5					1 7	.1 .7	.3 1.6	1.9 13.3
Total Taxa		2	1	2	2	1	8	5	2	0	3	9	2.6	2.3	-
Total individuals		9	2	4	4	1	29	12	7	0	5	73	7.3	8.5	139.3
Sample depth in metres		2.0	2.0	1.0	1.0	3.5	3.5	4.0	5.0	5.0	5.0	-	3.2	1.6	-

APPENDIX IX. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministiquia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 9										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
TRICHOPTERA Sp.															
DIPTERA Tendipedidae					1							1	.1	.3	1.9
ACARI (MITES) Sp.				1								1	.1	.3	1.9
ISOPODA Asellus															
AMPHIPODA Gammarus Crangonyx															
TURBELLARIA Sp.															
LIGOCHAETA Sp.		70	273	72	12	979	760	810	840	450	660	4926	492.6	364.2	9330.0
HIRUDINEA Erpobdella Helobdella															
GASTROPODA Physa <u>Valvata sincera</u> <u>V. tricarinata</u>															
PELECYPODA Sphaerium Pisidium		3		2	1							6	.6	1.1	11.4
Total Taxa		2	1	3	3	1	1	1	1	1	1	4	1.5	.9	-
Total individuals		73	273	75	14	979	760	810	840	450	660	4934	493.4	363.2	9416.0
Sample depth in metres		2.5	2.0	2.0	2.5	6.0	7.0	7.0	6.5	7.0	7.0	-	5.0	2.4	-

APPENDIX X. Thunder Bay Terminals survey - McKellar Island, macroinvertebrates collected from Kaministikwia and McKellar Rivers, July, 1975.

Taxa	Sample	STATION 10										Total per Station	Mean per Sample	σ	Total per sq.m.
		1	2	3	4	5	6	7	8	9	10				
TRICHOPTERA Sp.															
DIPTERA Tendipedidae		1	1	1		1			1			5	.5	.5	9.5
ACARI (MITES) Sp.															
ISOPODA Asellus			3		3							6	.6	1.3	11.4
AMPHOPODA Gammarus Crangonyx															
TURBELLARIA Sp.															
OLIGOCHAETA Sp.		142	28	149	210	600	720	220	900	580	630	4179	417.9	300.0	7975.0
HIRUDINEA Erpobdella Helobdella		1		1								2 1	.2 .1	.4 .3	3.8 1.9
GASTROPODA Physa Valvata sincera <u>V. tricarinata</u>												1	.1	.3	1.9
PELECYPODA Sphaerium Pisidium		2			3		1					6	.6	1.1	11.4
Total Taxa		5	4	3	3	2	2	1	2	1	1	7	2.4	1.4	-
Total individuals		147	33	151	216	601	721	220	900	580	630	4199	420.0	299.0	8013.0
Sample depth in metres		2.0	3.0	3.0	2.0	5.0	5.0	5.0	7.0	7.0	7.0	-	4.6	2.0	-

APPENDIX 3

1977-85 Benthic Survey Locations
and Results
(from McKee et al., 1987)

FIGURE 1

Thunder Bay Generating Station Study Area

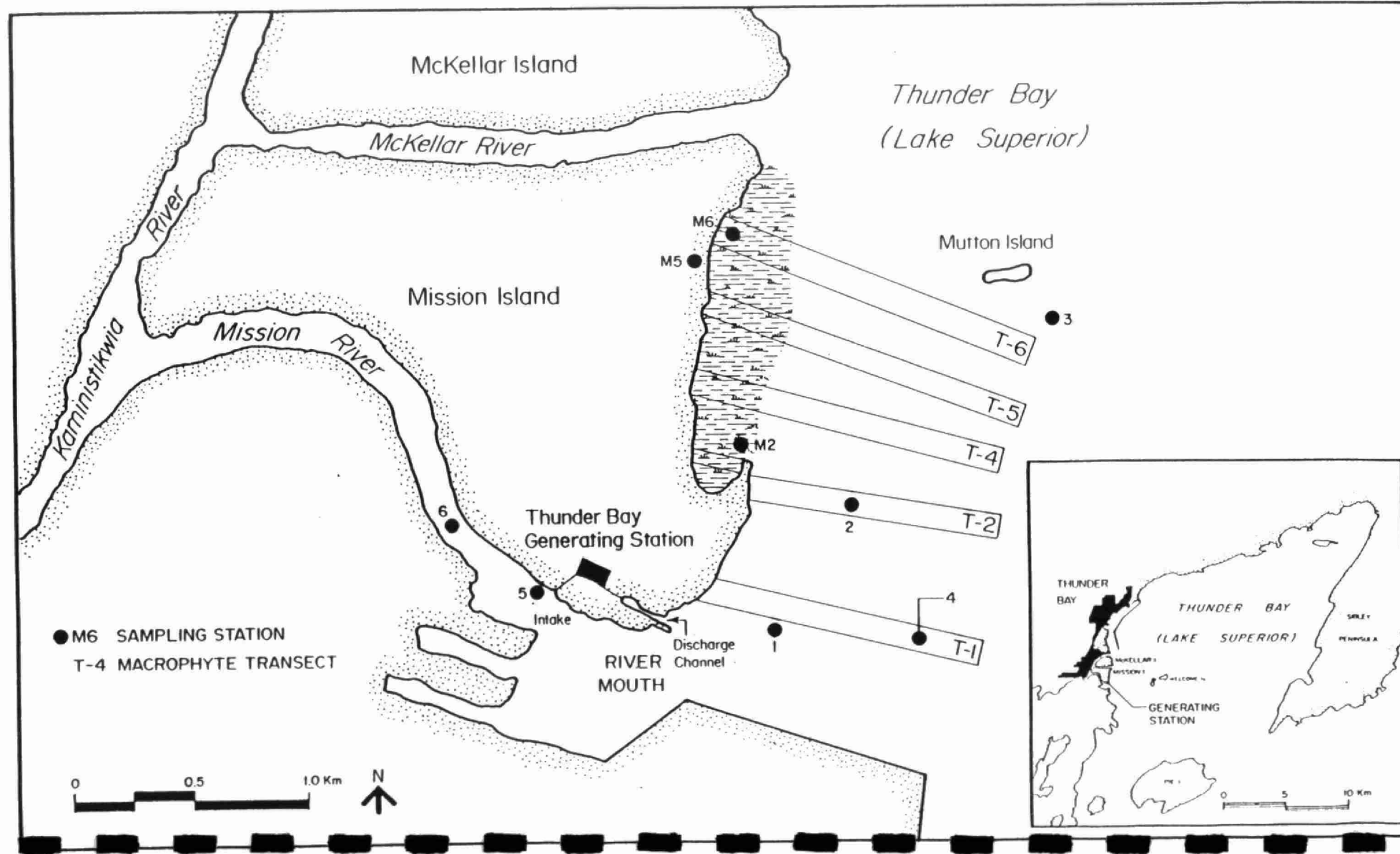


Table 6: Density Per m² (Geometric Mean) of the Major Taxa of Benthic Macroinvertebrates at Stations 1 to 5, May to September, 1977

	Station 1			Station 2			Station 3			Station 4			Station 5		
	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept
PHYLUM ARTHROPODA															
Class Insecta															
O. Ephemeroptera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O. Odonata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O. Trichoptera	-	-	-	1	1	-	-	7	1	-	-	-	-	-	1
O. Coleoptera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
O. Lepidoptera	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
O. Hemiptera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
O. Diptera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Chironomidae	85	59	419	245	56	398	1349	299	232	501	228	421	12	11	155
F. Ceratopogonidae	1	2	-	-	1	-	-	-	-	2	1	1	-	-	-
Other Families	-	-	1	-	-	-	-	-	-	-	-	-	-	-	32
Class Arachnida															
O. Acarina	-	-	-	-	-	14	204	15	15	5	4	16	-	-	-
Class Crustacea															
Subclass Malacostraca															
O. Isopoda	-	-	-	-	-	-	14	37	27	8	14	5	-	-	-
O. Amphipoda	-	-	3	-	-	-	-	35	28	1	2	1	-	-	1
PHYLUM MOLLUSCA															
Class Gastropoda	-	3	-	4	-	3	14	2	42	2	2	1	-	-	-
Class Pelecypoda	66	681	778	89	127	373	1122	563	802	234	357	629	417	396	162
PHYLUM COELENTERATA															
-	-	-	38	-	1	4	-	1	-	-	-	41	-	-	-
PHYLUM NEMATODA															
-	-	-	-	-	-	35	766	205	85	41	8	21	5	-	3
PHYLUM PLATYHELMINTHES															
Class Turbellaria	-	-	4	-	-	1	-	-	13	-	-	1	-	-	60
PHYLUM ANNELIDA															
Class Hirudinea	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-
Class Oligochaeta	2572	14469	23390	1096	1515	4952	3388	5086	1850	1862	5182	5025	64683	179560	161224
Cocoons	1903	2015	1556	1175	1139	1216	12882	3396	2337	1096	5905	2348	94624	23759	64
Class Polychaeta	411	4005	5621	195	496	691	245	8429	3069	562	5447	3419	-	-	-
Total Number of Organisms	5170	22919	32775	2884	3370	7826	20417	18273	11380	4677	17614	12242	162181	205680	161750
Total Number of Taxa	5	6	8	7	7	9	8	11	11	10	10	12	5	3	12

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1/11/77

Table A22: Detailed identification of benthos
Thunder Bay Generating Station - May 1977

STATION:	1	2	3	4	5
<u>INSECTA</u>					
TRICHOPTERA					
Leptoceridae					
Mystacides sepulchralis	-	1	-	-	-
Oecetis sp.	-	-	-	-	-
Hydroptilidae					
Hydroptila sp.	-	-	-	-	-
DIPTERA					
Chironomidae					
pupae sp. indet.	2	3	16	24	-
Chironominae					
Chironomus sp.	-	-	-	-	-
Cryptochironomus sp.	2	29	-	-	-
Paracladopelma sp.	-	3	-	16	-
Polypedilum sp.	-	-	12	-	-
Demicryptochironomus sp.	-	-	-	-	-
Orthocladiinae					
Cricotopus sp.	-	-	-	-	-
Heterotrissocladius ?changi	-	6	60	36	-
Diamesinae					
Potthastia longimanus	2	3	8	-	-
Monodiamesa bathyphila	-	10	4	8	-
Monodiamesa sp.	-	-	-	-	-
Protanypus sp.	-	-	-	-	-
Tanypodinae					
Ablabesmyia sp.	-	-	4	-	-
Procladius sp.	14	11	68	100	64
Coelotanypus sp.	-	-	-	-	64
Ceratopogonidae					
Bezzia sp.	-	-	-	4	-
Tipulidae					
pupae sp. indet.	-	-	-	-	-
Chaoboridae					
Chaoborus sp.	-	-	-	-	-
<u>ARACHNIDA</u>					
ACARINA					
sp. indet.	-	-	12	-	-

Table A22: (continued)

	STATION:	1	2	3	4	5
<u>CRUSTACEA</u>						
ISOPODA						
Asellidae						
Asellus sp.	-	-	4	4	-	-
AMPHIPODA						
Gammaridae						
Gammarus fasciatus	-	-	-	-	-	-
<u>GASTROPODA</u>						
Valvatidae						
Valvata tricarinata	-	-	8	-	-	-
Hydrobiidae						
Amnicola limosa	-	-	-	4	-	-
<u>PELECYPODA</u>						
Sphaeriidae						
Sphaerium striatum	-	-	-	-	-	-
S. nitidum	4	-	-	-	-	-
S. sp.	4	5	28	36	192	-
Pisidium sp.	14	10	104	52	64	-
<u>COELENTERATA</u>						
sp. indet.	-	-	-	-	-	-
<u>NEMATODA</u>						
sp. indet.	-	2	92	16	-	-
<u>PLATYHELMINTHES</u>						
TURBELLARIA						
sp. indet.	-	-	-	-	-	-

Table A22: (continued)

STATION:	1	2	3	4	5
<u>ANNELIDA</u>					
POLYCHAETA					
Sabellidae					
Manayunkia speciosa	138	64	56	368	-
OLIGOCHAETA					
Tubificidae					
Limnodrilus hoffmeisteri	121	97	-	14	531
L. claparedianus	-	6	-	14	531
L. profundicola	22	6	-	-	-
L. angustipenis	11	6	-	-	-
Tubifex tubifex	33	-	-	-	8496
Pelosclex multisetosus	-	17	13	313	-
P. freyi	-	-	-	-	-
Potamothrix moldaviensis	11	29	-	-	-
Ilyodrilus templetoni	-	-	-	-	-
Bothrioneurum vej dovskanum	-	-	-	-	-
Aulodrilus americanus	-	-	-	-	-
immature capilliiform	264	6	-	-	5741
immature non-capilliiform	44	46	-	27	3186
Naididae					
Nais sp.	-	6	-	14	-
Stylaria sp.	-	-	-	-	-
Lumbriculidae					
Stylodrilus heringianus	-	-	400	109	-
S. sp.	11	6	-	-	-
DIVERSITY*	2.62	3.48	2.79	2.88	0.90

*Immature Tubificidae not included

Table A23: Detailed identification of benthos
Thunder Bay Generating Station - July 1977

STATION:	1	2	3	4	5
<u>INSECTA</u>					
TRICHOPTERA					
Leptoceridae					
Mystacides sepulchralis	-	-	-	-	-
Oecetis sp.	-	1	3	-	-
Hydroptilidae					
Hydroptila sp.	-	-	-	-	-
DIPTERA					
Chironomidae					
pupae sp. indet.					
Chironominae					
Chironomus sp.	-	-	-	-	-
Cryptochironomus sp.	-	-	-	-	-
Paracladopelma sp.	-	-	3	3	-
Polypedilum sp.	-	-	-	-	-
Demicryptochironomus sp.	-	-	5	-	-
Orthoclaadiinae					
Cricotopus sp.	2	-	-	-	-
Heterotrissocladius ?changi	-	-	16	-	-
Diamesinae					
Potthastia longimanus	-	-	1	-	-
Monodiamesa bathyphila	-	10	33	-	-
Monodiamesa sp.	-	-	-	-	-
Protanypus sp.	-	-	1	2	-
Tanypodinae					
Ablabesmyia sp.	-	-	-	-	-
Procladius sp.	13	1	11	21	8
Coelotanypus sp.	-	-	-	-	-
Ceratopogonidae					
Bezzia sp.	-	-	-	-	-
Tipulidae					
pupae sp. indet.	-	-	-	-	-
Chaoboridae					
Chaoborus sp.	-	-	-	-	-
<u>ARACHNIDA</u>					
ACARINA					
sp. indet.	-	-	2	1	-

Table A23: (continued)

	STATION:	1	2	3	4	5
<u>CRUSTACEA</u>						
ISOPODA						
Asellidae						
Asellus sp.		-	-	17	4	-
AMPHIPODA						
Gammaridae						
Gammarus fasciatus		-	-	11	-	-
<u>GASTROPODA</u>						
Valvatidae						
Valvata tricarinata		1	-	-	-	-
Hydrobiidae						
Amnicola limosa		-	-	6	-	-
<u>PELECYPODA</u>						
Sphaeriidae						
Sphaerium striatum ⁵²		-	-	3	-	16
S. nitidum		-	-	-	-	-
S. sp.		3	7	11	12	56
Pisidium sp.		92	25	140	26	-
<u>COELENTERATA</u>						
sp. indet.		216	-	-	-	-
<u>NEMATODA</u>						
sp. indet.		-	-	112	3	-
<u>PLATYHELMINTHES</u>						
TURBELLARIA						
sp. indet.		-	-	7	-	-

Table A23: (continued)

STATION:	1	2	3	4	5
<u>ANNELIDA</u>					
POLYCHAETA					
Sabellidae					
Manayunkia speciosa	800	150	2592	1360	-
OLIGOCHAETA					
Tubificidae					
Limnodrilus hoffmeisteri	-	-	101	-	-
L. claparedianus	-	-	-	-	-
L. profundicola	-	-	-	29	-
L. angustipenis	-	-	-	-	-
Tubifex tubifex	-	7	-	-	-
Peloscolex multisetosus	56	35	471	723	2404
P. freyi	-	-	236	87	-
Potamothrix moldaviensis	-	35	-	-	-
Ilyodrilus templetoni	-	-	34	-	-
Bothrioneurum vej dovskanum	-	7	-	-	-
Aulodrilus americanus	-	-	-	-	-
immature capilliiform	1690	21	-	-	26444
immature non-capilliiform	338	112	202	87	-
Naididae					
Nais sp.	395	49	34	-	-
Stylaria sp.	-	35	-	-	-
Lumbriculidae					
Stylodrilus heringianus	-	-	67	202	601
S. sp.	-	-	-	-	-
DIVERSITY*	1.89	2.68	1.95	1.80	0.91

*Immature Tubificidae not included

Table A24: Detailed identification of benthos
Thunder Bay Generating Station - September 1977

STATION:	1	2	3	4	5
<u>INSECTA</u>					
TRICHOPTERA					
Leptoceridae					
Mystacides sepulchralis	-	-	-	-	-
Oecetis sp.	-	-	-	-	-
Hydroptilidae					
Hydroptila sp.	-	-	1	-	-
DIPTERA					
Chironomidae					
pupae sp. indet.	-	-	-	-	-
Chironominae					
Chironomus sp.	-	-	-	-	1
Cryptochironomus sp.	2	2	-	-	-
Paracladopelma sp.	-	-	-	-	-
Polypedilum sp.	-	-	-	-	-
Demicryptochironomus sp.	-	-	-	-	-
Orthocladiinae					
Cricotopus sp.	-	-	-	-	-
Heterotrissocladius ?changi	-	-	-	-	-
Diamesinae					
Potthastia longimanus	-	2	-	-	-
Monodiamesa bathyphila	-	10	14	6	-
Monodiamesa sp.	-	-	-	-	-
Protanypus sp.	-	-	-	1	-
Tanypodinae					
Ablabesmyia sp.	-	-	-	-	2
Procladius sp.	87	75	35	88	10
Coelotanypus sp.	-	-	-	-	-
Ceratopogonidae					
Bezzia sp.	-	-	-	-	-
Tipulidae					
pupae sp. indet.	1	-	-	-	3
Chaoboridae					
Chaoborus sp.	-	-	-	-	1
<u>ARACHNIDA</u>					
ACARINA					
sp. indet.	-	1	5	4	-

Table A24: (continued)

	STATION:				
	1	2	3	4	5
<u>CRUSTACEA</u>					
ISOPODA					
Asellidae					
Asellus sp.	-	-	12	2	-
AMPHIPODA					
Gammaridae					
Gammarus fasciatus	1	-	7	-	1
<u>GASTROPODA</u>					
Valvatidae					
Valvata tricarinata	-	-	-	-	-
Hydrobiidae					
Amnicola limosa	-	-	5	-	-
<u>PELECYPODA</u>					
Sphaeriidae					
Sphaerium striatum	-	-	-	-	-
S. nitidum	-	-	-	-	-
S. sp.	4	3	4	-	-
Pisidium sp.	131	98	221	116	2 13
<u>COELENTERATA</u>					
sp. indet.	72	-	-	28	-
<u>NEMATODA</u>					
sp. indet.	-	8	4	8	-
<u>PLATYHELMINTHES</u>					
TURBELLARIA					
sp. indet.	25	-	3	1	5

Table A24: (continued)

STATION:	1	2	3	4	5
<u>ANNELIDA</u>					
POLYCHAETA					
Sabellidae					
Manayunkia speciosa	576	160	632	792	-
OLIGOCHAETA					
Tubificidae					
Limnodrilus hoffmeisteri	-	22	-	-	269
L. claparedianus	-	-	-	-	-
L. profundicola	-	22	-	-	-
L. angustipenis	-	-	-	-	-
Tubifex tubifex	-	-	-	-	-
Peloscolex multisetosus	150	130	191	480	269
P. freyi	-	-	-	-	-
Potamothrix moldaviensis	-	-	-	-	-
Ilyodrilus templetoni	-	-	-	-	-
Bothrioneurum vej dovskanum	-	-	-	-	-
Aulodrilus americanus	-	22	-	-	-
immature capilliform	1568	43	17	360	13988
immature non-capilliform	960	8136	418	-	1076
Naididae					
Nais sp.	2240	65	52	300	269
Stylaria sp.	-	-	-	30	-
Lumbriculidae					
Stylodrilus heringianus	-	-	35	30	-
S. sp.	-	-	-	-	-
DIVERSITY*	1.59	2.90	1.85	2.28	1.89

*Immature Tubificidae not included

Table 7a: Geometric Mean Numbers of Major Taxa of Benthic Organisms Found at Stations 1 to 5 in July and October 1978.

Date	1		2		3		4		5	
	July	October	July	October	July	October	July	October	July	October
PHYLUM ARTHROPODA										
Class Insecta										
O. Ephemeroptera										
O. Odonata										
O. Trichoptera	-	-	-	-	4	-	-	-	-	-
O. Coleoptera	1	-	-	-	-	-	-	-	-	-
O. Lepidoptera										
O. Hemiptera										
O. Diptera										
F. Chironomidae	19	39	22	28	218	93	137	42	-	464
F. Ceratopogonidae	-	1	-	-	-	-	-	-	-	-
Other Families										
Class Arachnida										
O. Acarina	-	-	-	-	31	-	4	-	-	-
Class Crustacea										
Subclass Malacostraca										
O. Isopoda	-	-	-	-	10	1	5	-	-	-
O. Amphipoda	-	-	-	-	10	14	-	-	-	-
PHYLUM MOLLUSCA										
Class Gastropoda	-	-	-	-	85	-	8	-	-	-
Class Pelecypoda	217	57	48	25	801	87	233	34	88	197
PHYLUM COELENTERATA	37	1	4	4	10	1		1		74
PHYLUM NEMATODA	35	-	16	-	881	7	76	10	168	-
PHYLUM PLATYHELMINTHES										
Class Turbellaria	21	-	8	-	149	-	-	1	-	-
PHYLUM ANNELIDA										
Class Hirudinea										
Class Oligochaeta	3945	3857	870	1779	4797	1022	2745	950	336642	151609
Cocoons	1764	316	1167	244	5085	148	3588	350	28626	1673
Class Polychaeta	545	64	68	42	11856	49	709	83	-	-
TOTAL NO. OF ORGANISMS	6584	4335	2203	2122	23917	1422	7505	1478	365524	154018
TOTAL NO. OF TAXA	8	6	7	5	12	8	8	7	3	5

Table A46: Detailed identification of benthos
Thunder Bay Generating Station - July, October 1978

	July		October	
	Stn. 1	Stn. 3	Stn. 1	Stn. 3
<u>INSECTA</u>				
COLEOPTERA				
Elmidae				
Optioservus sp.	1	-	-	-
DIPTERA				
Chironomidae				
Chironominae				
Cryptochironomus sp.	-	6	1	3
Endochironomus sp.	-	-	-	1
Stictochironomus sp.	-	-	-	11
Diamesinae				
Prodiamesa sp.	-	8	1	-
sp. indet.	-	2	-	-
Orthocladiinae				
Heterotrissocladius sp.	1	4	-	-
Tanypodinae				
Procladius sp.	1	-	11	-
Tanypus sp.	-	6	-	-
Ceratopogonidae				
Bezzia sp.	-	-	2	-
<u>CRUSTACEA</u>				
ISOPODA				
Asellidae				
Asellus sp.	-	2	-	1
AMPHIPODA				
Gammaridae				
Gammarus fasciatus	-	-	-	4
Gammarus sp.	-	4	-	-
<u>GASTROPODA</u>				
Viviparidae				
sp. indet.	-	2	-	-

Table A46: (continued)

	July		October	
	Stn. 1	Stn. 3	Stn. 1	Stn. 3
<u>PELECYPODA</u>				
Sphaeriidae				
Pisidium sp.	25	30	3	4
Sphaerium sp.	3	2	6	11
<u>COELENTERATA</u>				
sp. indet.	4	4	-	-
<u>NEMATODA</u>				
sp. indet.	2	72	2	2
<u>PLATYHELMINTHES</u>				
TURBELLARIA				
sp. indet.	2	16	-	-
ANNELIDA				
POLYCHAETA				
Sabellidae				
Manayunkia speciosa	60	160	42	5
OLIGOCHAETA				
Tubificidae				
Aulodrilus pluriseta	-	-	38	-
Limnodrilus hoffmeisteri	36	-	19	-
L. profundicola	-	-	77	-
Tubifex tubifex	36	63	19	12
Peloscolex ferox	-	-	58	12
P. freyi	84	63	-	-
P. multisetosus	-	21	-	-
Potamothrix moldaviensis	12	42	19	6
P. vej dovskyi	-	-	19	-
sp. indet.	-	-	116	22
immature capilliform	36	-	39	-
immature non-capilliform	216	128	520	121

Table A47: (continued)

	July		October	
	Stn. 1	Stn. 3	Stn. 1	Stn. 3
Naididae				
Nais sp.	96	63	39	12
Stylaria sp.	-	106	-	-
Arcteonais lomondi	-	-	19	6
Lumbriculidae				
Stylodrilus sp.	36	42	116	6
DIVERSITY*	2.98	3.50	3.41	3.63

*Immature tubificids not included.

Table 8a: Geometric Mean Numbers of Major Taxa of Benthic Organisms Found at Stations 1, 2, 3, 5 and 6 in July and November, 1979 (Numbers per m²)

	Station 1		Station 2		Station 3		Station 5		Station 6	
	July	Nov	July	Nov	July	Nov	July	Nov	July	Nov
PHYLUM ARTHROPODA										
Class Insecta										
O. Ephemeroptera										
O. Odonata										
O. Trichoptera	-	-	-	-	0.8	-	-	-	-	-
O. Coleoptera										
O. Lepidoptera										
O. Hemiptera										
O. Diptera										
F. Chironomidae	13.4	53.4	32.6	203.2	118.4	311.3	1.1	95.5	5.0	-
F. Ceratopogonidae	0.8	6.3	-	0.8	-	0.8	0.8	-	-	-
Other Families	0.8									
Class Arachnida										
O. Acarina	-	-	-	3.5	0.8	1.5	-	-	-	-
Class Crustacea										
Subclass Malacostraca										
O. Isopoda	-	-	-	1.5	-	-	-	-	-	-
O. Amphipoda	-	-	-	5.7	-	2.9	-	-	-	-
PHYLUM MOLLUSCA										
Class Gastropoda	-	-	-	0.8	0.8	1.5	-	-	-	-
Class Pelecypoda	50.4	107.3	42.2	237.9	279.8	363.3	178.2	324.9	19.6	47.6
PHYLUM COELENTERATA										
	6.1	-	14.5	0.8	2.2	-	-	-	-	-
PHYLUM NEMATODA										
	2.3	5.0	0.8	17.2	54.7	132.1	0.8	-	-	4.3
PHYLUM PLATYHELMINTHES										
Class Turbellaria	13.1	0.8	22.4	18.7	5.3					
PHYLUM ANNELIDA										
Class Hirudinea										
Class Oligochaeta	12,380.8	24,138.9	1,472.4	2,689.5	2,433.7	2,689.4	273,635.2	57,288.0	283,811.2	312,255.5
Cocoons	4,942.9	107.5	1,956.6	1,050.1	6,204.4	5,141.3	122,875.9	2,320.4	56,414.9	2,315.3
Class Polychaeta	-	9.5	114.1	101.4	4,407.0	639.1	-	-	-	-
Total Number of Organisms	17,502.0	24,447.4	3,700.6	4,451.3	13,822.0	9,402.4	401,010.5	66,900.8	342,235.0	314,996.2
Total Number of Taxa	8.0	7.0	7.0	10.0	10.0	9.0	5.0	3.0	3.0	2.0

17,502
4,943
12,559

24,320

1746

3400

7,622

62,921

Table 9: Geometric mean densities (m^{-2}) of major taxa of benthic invertebrates at Stations 1, 2, 3, 5 and 6 in July 1981

	Stations				
	1	2	3	5	6
PHYLUM COELENTERATA	46				
PHYLUM PLATYHELMINTHES					
Class Turbellaria		48			
PHYLUM NEMATODA		4	190		
PHYLUM MOLLUSCA					
Class Gastropoda		2	4		
Class Bivalvia	370	211	464	57	
PHYLUM ANNELIDA					
Class Polychaeta	126	2 920	2 140		
Class Oligochaeta	18 700	3 710	5 600	102 600	275 300
PHYLUM ARTHROPODA					
Class Arachnida					
O. ¹ Acarina			3		
Class Crustacea					
O. Isopoda		2			
Subclass Ostracoda		3			
Class Insecta					
O. Coleoptera					10
O. Diptera					
F. ² Chironomidae	60	109	585		
F. Ceratopogonidae	2				
TOTAL ORGANISMS	19 200	7 210	9 190	103 000	275 700
TOTAL NUMBER OF TAXA	6	9	7	2	2

¹ O. = Order

² F. = Family

Table 10: Detailed identification of benthic invertebrates sampled by Ponar grab at Stations 1, 3, and 6, July and November 1978. Expressed as number of organisms per M².

	JULY			NOVEMBER		
	1	3	6	1	3	6
<u>COELENTERATA</u>						
unidentified species	9	33	0	0	0	0
<u>PLATYHELMINTHES</u>						
Class Turbellaria						
unidentified species	52	24	0	0	0	0
<u>NEMATODA</u>						
unidentified species	5	57	0	5	71	0
<u>MOLLUSCA</u>						
Class Bivalvia						
Family Sphaeriidae						
<i>Pisidium</i> sp.	66	170	0	47	94	0
<i>Musculium</i> sp.	42	123	47	61	118	755
<u>ANNELIDA</u>						
Class Polychaeta						
<i>Manayunkia speciosa</i>	0	5,815	0	19	1,020	0
Class Oligochaeta						
Family Lumbriculidae						
unidentified species	151	2,530	0	0	1,794	3,625
Family Naididae						
<i>Nais</i> sp.	5,551	113	0	0	113	0
Family Tubificidae						
<i>Limnodrilus cervix</i>	151	0	18,125	529	0	0
<i>L. hoffmeisteri</i>	831	0	0	3,323	0	3,625
<i>L. profundicola</i>				0	0	3,625
<i>Pelosclex</i> sp.	0	0	0	0	0	3,625
<i>P. ferox</i>	0	0	0	0	94	0
<i>P. multisetosus</i>	0	982	24,166	0	264	0
<i>Potamotheix moldaviensis</i>	151	0	0	0	0	0
<i>P. vejovskyi</i>	1,171	0	0	0	0	0
<i>Tubifex tubifex</i>	340	0	0	0	0	29,000
immature capilliform	491	113	218,706	5,966	57	164,332
immature noncapilliform	8,005	113	66,458	18,653	170	65,249
cocoons	8,572	7,023	71,290	99	4,720	2,266
<u>INSECTA</u>						
Order Trichoptera						
Family Limnephilidae						
<i>Limnephilus</i> sp.	0	5	0	0	0	0

Table 10: (cont'd)

	JULY			NOVEMBER		
	1	3	6	1	3	6
Order Diptera						
Family Chironomidae						
unidentified pupae	5	0	0	0	0	0
Subfamily Tanypodinae						
<i>Procladius</i> sp.	5	99	9	52	123	0
Subfamily Diamesinae						
<i>Diamesa</i> sp.	0	0	0	0	9	0
<i>Prodiamesa</i> sp.	0	0	0	19	113	0
Subfamily Orthoclaadiinae						
<i>Heterotrissocladius</i> sp.	0	0	0	0	0	5
Subfamily Chironominae						
<i>Cryptochironomus</i> sp.	0	61	0	0	0	0
<i>Parachironomus</i> sp.	5	0	0	0	0	0
<i>Polypedilum</i> sp.	0	0	0	0	5	0
Total No. Taxa*	15	12	4	8	12	7
Shannon Diversity*	1.79	1.74	1.00	0.95	2.31	1.68

*excluding oligochaete cocoons and immature forms

Table 11: Species and densities (m^{-2}) of benthic invertebrates sampled by Ponar at Stations 1, 3 and 6 in July 1984

	Stations		
	1	3	6
PHYLUM COELENTERATA	690		
PHYLUM NEMATODA		170	
PHYLUM MOLLUSCA			
Class Gastropoda			
F. ¹ Valvatidae			
<u>Valvata sincera</u>		80	
<u>Valvata tricarinata</u>		80	
Class Bivalvia			
F. Pisidiidae ²			
<u>Pisidium</u> sp.	770		
<u>Musculium</u> sp.	80		
PHYLUM ANNELIDA			
Class Polychaeta			
F. Sabellidae			
<u>Manayunkia speciosa</u>	230	1 770	
Class Oligochaeta			
F. Lumbriculidae			
sp. indet.		4 390	4 190
F. Tubificidae			
<u>Limnodrilus cervix</u>			8 360
<u>Limnodrilus hoffmeisteri</u>		160	8 360
<u>Limnodrilus udekemianus</u>	320		
<u>Peloscolex ferox</u>		660	16 700
<u>Peloscolex multisetosus</u>			8 360
<u>Potamothrix vejdoskyi</u>	1 270		
<u>Tubifex tubifex</u>	1 900	82	79 400
immature capilliiform	320		58 500
immature non-capilliiform	12 350	160	79 400

Table 11: (continued)

	Stations		
	1	3	6
PHYLUM ARTHROPODA			
Class Insecta			
O. Coleoptera			
F. Elmidae			
<u>Optioservus</u> sp.			1 230
O. Diptera			
F. Ceratopogonidae			
<u>Bezzia</u> complex	150		
F. Chironomidae			
<u>Harnischia</u> sp.		460	
<u>Eukiefferiella?</u> sp.	77		
<u>Procladius</u> sp.		230	
<hr/>			
TOTAL DENSITY	18 150	8 560	264 600
DIVERSITY	2.54	2.06	1.81

1 Family

2 Pisidiidae were called Sphaeriidae in pre-operational reports. McKee and Mackie (1981) explained the taxonomic error in the use of latter family name.

3 Order

TABLE 11a: GEOMETRIC MEAN DENSITIES (m^{-2}) OF MAJOR TAXA OF BENTHIC INVERTEBRATES AT STATIONS 1, 2, 3, 5 AND 6 IN JULY 1982

	1	2	3	5	6
PHYLUM NEMATODA		1	320		
PHYLUM MOLLUSCA					
Class Gastropoda			105		
Class Bivalvia	330	390	1,200		
PHYLUM ANNELIDA					
Class Polychaeta	730	1,560	4,400		
Class Oligochaeta	24,300	4,190	2,900	250,000	154,000
Class Hirudinea	1				
PHYLUM ARTHROPODA					
Class Arachnida					
O. ¹ Acarina		6	4		
Class Crustacea					
O. Isopoda			140		
Class Insecta					
O. Ephemeroptera			1		
O. Trichoptera		3			
O. Diptera					
F. ² Chironomidae		230	760		
Total No. of Organisms	25,800	6,740	10,600	250,000	154,000
Total No. of Taxa	4	7	9	1	1

¹ O. = Order

² F. = Family

TABLE 12: SPECIES, DENSITIES (m^{-2}) AND DIVERSITIES OF BENTHIC INVERTEBRATES SAMPLED BY PONAR AT STATIONS 1, 3 AND 6 IN JULY 1982

	Stations		
	1	3	6
PHYLUM NEMATODA		320	
PHYLUM MOLLUSCA			
Class Gastropoda			
F. Valvatidae		210	
<u>Valvata sincera</u>			
Class Bivalvia			
F. Pisidiidae		320	
<u>Sphaerium</u> sp.		1 280	
<u>Pisidium</u> sp.	210		
PHYLUM ANNELIDA			
Class Polychaeta			
<u>Manayunkia speciosa</u>	640	9 100	
Class Oligochaeta			
F. Lumbriculidae		2 240	
<u>Stylodrilus heringianus</u>			
F. Naididae			18 800
<u>Nais</u> sp.	1 100	110	
F. Tubificidae			6 830
<u>Limnodrilus cervis</u>			1 700
<u>Limnodrilus hoffmeisteri</u>	1 100		22 200
<u>Peloscolex ferox</u>			11 900
<u>Peloscolex multisetosus</u>		110	37 500
<u>Tubifex tubifex</u>	4 500		85 300
immature capilliform	7 500		44 400
immature non-capilliform	22 600	430	
Class Hirudinea			
F. Erpobdellidae	7		
PHYLUM ARTHROPODA			
Class Crustacea			
O. Isopoda		110	
<u>Asellus</u> sp.			
Class Insecta			
O. Diptera			
F. Chironomidae		210	
<u>Harnischia</u> sp.		750	
<u>Procladius</u> sp.			
TOTAL DENSITY ¹	37 600	15 100	230 000
DIVERSITY ²	1.70	1.94	2.20

¹ density including immature Tubificidae
² diversity, excluding immature Tubificidae

TABLE 11b: GEOMETRIC MEAN DENSITIES (m^{-2}) OF MAJOR TAXA* OF BENTHIC INVERTEBRATES AT STATIONS 1, 2, 3, 5 AND 6 IN JULY AND OCTOBER 1984

	JULY				
	1	2	Stations 3	5	6
PHYLUM COELENTERATA					
Class Hydrozoa		3			
PHYLUM PLATYHELMINTHES					
Class Turbellaria	1	31			
PHYLUM NEMATODA		24	330		
PHYLUM MOLLUSCA					
Class Gastropoda		24	62	8	
Class Bivalvia	140	600	1,340	53	160
PHYLUM ANNELIDA					
Class Polychaeta	320	950	5,370		
Class Oligochaeta	14,100	3,060	6,670	108,000	48,100
PHYLUM ARTHROPODA					
Class Arachnida					
O. ¹ Acarina	1	1	21		
Class Crustacea					
O. Ostracoda		5	27		
O. Isopoda	1		4	3	
O. Amphipoda		3	150		
Class Insecta					
O. Trichoptera					
O. Diptera					
F. ² Chironomidae	13	330	660	1,340	200
F. Ceratopogonidae	12	4			
Total No. of Organisms	14,600	5,100	15,600	110,000	48,500
Total No. of Taxa	8	12	10	5	3
	OCTOBER				
	1	2	Stations 3	5	6
PHYLUM COELENTERATA					
Class Hydrozoa	1	1			
PHYLUM PLATYHELMINTHES					
Class Turbellaria		4			
PHYLUM NEMATODA	4	22	800		
PHYLUM MOLLUSCA					
Class Gastropoda		4	510	5	
Class Bivalvia	140	170	2,190	1,130	1,500
PHYLUM ANNELIDA					
Class Polychaeta	780	710	3,180		
Class Oligochaeta	1,340	940	4,400	79,200	108,800
PHYLUM ARTHROPODA					
Class Arachnida					
O. ¹ Acarina	1	1	240		
Class Crustacea					
O. Ostracoda		1	320		
O. Isopoda		1	79		
O. Amphipoda		1	100		
Class Insecta					
O. Trichoptera			3		
O. Diptera					
F. ² Chironomidae	120	120	760	5,510	2,300
F. Ceratopogonidae	3				
Total No. of Organisms	2,420	2,000	12,800	81,400	110,400
Total No. of Taxa	8	12	11	4	3

1 O. = Order

2 F. = Family

* Blanks in table indicates no organisms in the samples.

TABLE 11: SPECIES, DENSITIES* (No./m²) AND DIVERSITIES OF BENTHIC INVERTEBRATES SAMPLED BY PONAR AT STATIONS 1, 3 AND 6 IN JULY AND OCTOBER 1984

	Stations					
	July			October		
	1	3	6	1	3	6
PHYLUM COELENTERATA						
Class Hydrozoa						
O. Hydroida						
F. Hydridae						
<u>Hydra</u> sp.				7		
PHYLUM PLATYHELMINTHES						
Class Turbellaria						
sp. indet.	7					
PHYLUM NEMATODA						
sp. indet.		270		7	960	
PHYLUM MOLLUSCA						
Class Bivalvia						
F. Pisiidae						
Musculium sp.	40		320	13		427
Pisidium sp.	153	1,813		140	2,453	2,560
Sphaerium sp.		160		7		
Class Gastropoda						
F. Valvatidae						
Valvata sincera		373			587	
V. tricarinata		107			213	
PHYLUM ANNELIDA						
Class Polychaeta						
Manyunkia speciosa	480	7,680		1,033	4,267	
Class Oligochaeta						
F. Lumbriculidae						
Stylodrilus heringianus	492	3,764		77	3,200	
F. Naididae						
Stylaria fossularis	492					
F. Tubificidae						
Aulodrilus pluriset				179	107	
Limnodrilus hoffmeisteri	492	198	796	204	107	5,955
L. udekemianus	983			51		2,977
Potamothrix moldaviensis				26		
Quistadrilus multisetosus	1,475	198	1,593		107	5,955
Spirosperma ferox		1,981	1,593	204	1,280	2,977
Tubifex tubifex	1,475					5,955
immature capilliiform	3,442	594	28,672	51		89,322
immature non-capilliiform	11,309	198	3,186	383	213	23,819
PHYLUM ARTHROPODA						
Class Arachnida						
Hydracarina sp.	7	110		7	533	
Class Crustacea						
Subclass Malacostraca						
O. Isopoda						
F. Asellidae						
Asellus sp.		110			53	
O. Amphipoda						
F. Haustoriidae						
Pontoporeia sp.		270			53	
Subclass Ostracoda						
sp. indet.		430			320	
Class Insecta						
O. Trichoptera						
F. Leptoceridae						
Oecetis sp.					53	
O. Diptera						
pupae - sp. indet.	13					
F. Chironomidae						
S.F. Chironominae						
Cryptochironomus sp.				13	53	
Polypedium sp.					107	
S.F. Diametinae						
Monodiamesa sp.	13	53		27	160	
S.F. Orthocladinae						
Heterotrissocladius sp.		107			107	
S.F. Tanypodinae						
Procladius sp.	87	320	320	53	320	3,413
F. Ceratopogonidae						
Bezzia complex	20					
TOTAL DENSITY ¹	20,980	18,736	36,480	2,482	15,253	143,360
NO. OF TAXA ¹	17	19	7	18	21	10
DIVERSITY ²	2.90	2.62	2.03	2.55	3.09	2.79

¹ Density and number of taxa including immature Tubificidae.

² Diversity excluding immature Tubificidae.

* Blank in table indicates no individuals of a species found in sample.

TABLE 11c: GEOMETRIC MEAN DENSITIES (m^{-2}) OF MAJOR TAXA OF BENTHIC INVERTEBRATES AT STATIONS 1, 2, 3, 4, 5 AND 6 IN JULY 1985

	Stations					
	1	2	3	4	5	6
PHYLUM COELENTERATA						
Class Hydrozoa	22	5	3			
PHYLUM PLATYHELMINTHES						
Class Turbellaria		9				
PHYLUM NEMATODA	8	160	950	200		
PHYLUM NEMERTEA						2
PHYLUM MOLLUSCA						
Class Gastropoda		5	320			
Class Bivalvia	150	310	590	410	130	98
PHYLUM ANNELIDA						
Class Polychaeta	1,420	270	910	6,600	30	
Class Oligochaeta	7,750	3,500	10,900	6,400	51,600	363,300
Class Hirudinea				2		
PHYLUM ARTHROPODA						
Class Archnida		2		2		
Class Crustacea						
O. Isopoda	1	20	13	70		
O. Amphipoda		3	270			
Class Insecta						
O. Diptera						
F. Chironomidae	140	470	820	560	1,820	410
F. Ceratopogonidae				2		
Other Diptera						
O. Lepidoptera	2					2
TOTAL NO. OF ORGANISMS	9,650	4,900	15,700	14,400	53,800	363,900
TOTAL NO. OF TAXA	8	11	9	9	4	5

TABLE 11: SPECIES, DENSITIES* (N_0/m^2) AND DIVERSITIES OF BENTHIC INVERTEBRATES SAMPLED BY PONAR AT STATIONS 1 TO 6 IN JULY 1983

	Station					
	1	2	3	4	5	6
PHYLUM COELENTERATA						
Class Hydrozoa						
O. Hydroids						
F. Hydroids						
Hydra sp.	27	7				
PHYLUM PLATYHELMINTHES						
Class Turbellaria						
sp. indet.		33				
PHYLUM NEMERTIA						
Prostoma rubrum						
PHYLUM NEMATODA						
sp. indet.	27	73	747	213		
PHYLUM MOLLUSCA						
Class Bivalvia						
F. Pisidiidae						
Musculium sp.	27	40			107	27
Pisidium sp.	67	460	2,407	347	107	160
Sphaerium sp.				27		
Class Gastropoda						
F. Valvatidae						
Valvata sincera		7	373			
V. tricarinata		7	373			
PHYLUM ANNELIDA						
Class Polychaeta						
Manayunkia speciosa	693	653	693	4,962	320	
Class Oligochaeta						
F. Lumbricidae						
Styrodrius heringianus	68	567	1,268	533		
F. Naididae						
Arctonais lomondi	340	567	230			
Chaetogaster diaphanus	136	126				
Nais communis	68					
Ophidonais serpentina				53		
Ripistes parasilis		63				
Specaria josinae	476	126				
Stylaria fosularis	204	126	115			
Uncinaxis uncinata	1,291	1,430				
F. Tubificidae						
Aulodrius americanus		63				
Aulodrius pluriset	679	63		640		
Liyodrius templetoni				53		
Limnodrius cervix	68				2,830	6,809
L. holmeisteri	136		115	160	1,132	20,428
L. profundicola		252				
Potamothrix moldaviensis	204	315				
Quistadrius multisetosus			230	267	10,181	34,046
Spirosperma ferox	204	693	2,766	960	1,132	6,809
Tubifex tubifex						
Vejdovskvella comata	68	63				
V. intermedia	68					
immature capilliform	136		115	747	32,827	221,300
immature non-capilliform	1,563	630	115	1,120	4,527	37,430
Embryo						
PHYLUM ARTHROPODA						
Class Arachnida						
sp. indet.		20				
Class Crustacea						
Subclass Malacostraca						
O. Isopoda						
F. Asellidae						
Asellus sp.	13	33	53	27		
O. Amphipoda						
F. Haustoriidae						
Pontoporeia sp.		7	267			
Class Insecta						
O. Lepidoptera						
F. Pyralidae						27
sp. indet.						
O. Diptera						
pupae - sp. indet.	13	20	107			
F. Chironomidae						
S.F. Chironominae						
Cryptochironomus sp.		47				
Demicryptochironomus sp.	13					
Harnischia sp.	7	20	320	160		
Paracladopelma sp.	7					
Phaenopsectra sp.	7					
Polypedilum sp.	7					
S.F. Diamesinae						
Monodiamesa sp.	33	33	213	53	107	
Protonypus sp.		40				
S.F. Orthocladinae						
Heterotrissociadius sp.	7	107	267			
S.F. Tanyptodinae						
Ablabesmyia sp.	27					
Procladius sp.	53	87	160	240	853	480
F. Ceratopogonidae						
Bezzia complex	20					
TOTAL DENSITY						
	6,757	6,798	10,734	10,562	34,130	327,536
NO. OF TAXA						
	31	31	18	15	9	8
DIVERSITY						
	3.63	3.78	3.25	2.35	1.86	1.76

APPENDIX 4

**Species and Densities of
Benthic Invertebrates in 1985**

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	7-1	7-2	7-3	7-4	7-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						1
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa		1			1	4
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						4
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						
Ophidionais serpentina						
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus					22	6
A. limnobioides						1
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix			254			
L. clapparedianus						
L. hoffmeisteri					2	15
L. udekemianus		1				
Potamothrix moldaviensis						
P. vejovskyi		1				
Quistadrilus multisetosus						
Spirosperma ferox						1
Tubifex ignotus						
T. tubifex						
immature with hair setae			763			
immature without hair setae		1	6671		4	16
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						1
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						1
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.				1	3	1
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						1
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	7-1	7-2	7-3	7-4	7-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.				1	9	2
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.		1				
Demicryptochironomus sp.			1			
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.					3	8
Polypedium sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissociadius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.					1	
Procladius sp.			1		3	2
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium parvum						
M. transversum						
Sphaerium sp.			1			
Pisidium sp.						4
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						36
F. Planorbidae						
Helisoma anceps						1
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						2
TOTAL		5	7630	3	48	107
NO. OF TAXA		4	4	3	8	18
SHANNON-WEAVER DIVERSITY		1.92	0.47	1.58	2.33	2.02
RICHNESS		2.49	0.34	1.22	1.81	2.91
EVENNESS		0.83	0.24	1.00	0.78	0.47

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	8-1	8-2	8-3	8-4	8-5
				NO SAMPLE		NO SAMPLE
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa		1			2	
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arcteonais lomondi						
N. variabilis						
Ophidonais serpentina						
Ripistes parvula						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus		1			5	
A. limnobius						
A. plurisetus						
Hydrodrilus templetoni						
Limnodrilus cervix						
L. clapparedianus						
L. hoffmeisteri		2			2	
L. udekemianus						
Potamothenix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma ferox						
Tubifex ignotus						
T. tubifex						
Immature with hair setae						
Immature without hair setae		7			1	
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.		2			2	
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	8-1	8-2	8-3	8-4	8-5
				NO SAMPLE		NO SAMPLE
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.		6	1		1	
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.		2			2	
Demicryptochironomus sp.						
Dicrotendipes sp.					1	
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.					4	
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissociolus sp.						
S.F. Tanypodinae						
Ablabesmyia sp.		2			1	
Procladius sp.		5	1		1	
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum					1	
Sphaerium sp.						
Pisidium sp.		4				
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa		2				
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		34	2	-	23	-
NO. OF TAXA		10	2	-	11	-
SHANNON-WEAVER DIVERSITY		2.98	1.00	—	3.20	—
RICHNESS		2.55	1.44	—	3.19	—
EVENNESS		0.90	1.00	—	0.93	—

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	9-1	9-2	9-3	9-4	9-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus			36			
F. Naididae						
Arcteonais lomondi						
N. variabilis						
Ophidonais serpentina						
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinais uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix	51	71		107	154	
L. clapparedianus						
L. hoffmeisteri	102	178	18		463	
L. udekemianus		285	70		1234	
Potamothrix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma ferox					54	
Tubifex ignotus						
T. tubifex	25	36				386
immature with hair setae	305	283	88	54		309
immature without hair setae	1041	1494	929	3009		1774
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						2
F. Leptophlebiidae						
Leptophlebia sp.			1			
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	9-1	9-2	9-3	9-4	9-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.			8			
Polypedilum sp.				8		
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		1	8			5
F. Chironomidae pupae sp. Indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.						
Pisidium sp.						
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		1525	2402	1113	3224	4327
NO. OF TAXA		4	8	4	3	6
SHANNON-WEAVER DIVERSITY		1.48	1.93	1.13	0.75	1.62
RICHNESS		0.41	0.90	0.43	0.25	0.60
EVENNESS		0.74	0.64	0.57	0.16	0.64

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1983

Taxa	Station No.	11-1	11-2	11-3	11-4	11-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stygodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						
Ophidonais serpentina						
Ripistes parvula						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobius						
A. plurisetus						
Limnodrilus templetoni						
Limnodrilus cervix				196	285	28
L. clapparedianus						28
L. hoffmeisteri	235				285	28
L. udekemianus	1643	970				
Potamothrix moldaviensis						
P. vejdovskyi						
Quistadrilus multisetosus						
Spirosperma ferox						
Tubifex ignotus						
T. tubifex	469	388		285	28	
immature with hair setae	11029	7135	8612	15680	776	
immature without hair setae	1408	4460	2936	2281	804	
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						2
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	11-1	11-2	11-3	11-4	11-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						1
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicortendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.				1		
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						1
Procladius sp.		4				25
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.						
Pisidium sp.						4
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		14788	12993	11745	18816	1697
NO. OF TAXA		4	2	3	3	8
SHANNON-WEAVER DIVERSITY		0.89	0.98	0.81	0.72	1.0
RICHNESS		0.31	0.11	0.21	0.20	0.94
EVENNESS		0.45	0.98	0.53	0.49	0.55

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1983

Taxa	Station No. 12-1	12-2	12-3	12-4	12-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.					
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.					
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa					
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stylodrilus heringianus					
F. Naididae					
Arctonais lomondi					
N. variabilis				66	
Ophidona serpentina					
Ripistes parvita					
Stylaria fossularis					
S. lacustris					
Uncinaria uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobioides					
A. plurisetus	2			66	12
Ilyodrilus templetoni					
Limnodrilus cervix	1		86	199	
L. clapparedianus					
L. hoffmeisteri	1				
L. udekemianus				66	3
Potamothrix moldaviensis					
P. vejovskyi					
Quistadrilus multisetosus					
Spirosperma ferox					
Tubifex ignotus					
T. tubifex				66	
immature with hair setae	3	1778	4044	3114	14
immature without hair setae	8	2174	1118	1126	6
Cl. Hirudinea					
F. Eropobdellidae					
Dina sp.					
F. Glossiphoniidae					
Glossiphonia complanata					
Helobdella stagnalis					
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.					
O. Amphipoda					
F. Gammaridae					
Gammarus sp.					
Cl. Arachnida					
O. Hydracarina					
sp. indet.					
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.					
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.					

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	12-1	12-2	12-3	12-4	12-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.		1				
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		1		3	2	2
F. Chironomidae pupae sp. indet.				1		1
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.				2	1	
Pisidium sp.				6	1	
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps		1				
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		18	3952	5260	4707	38
NO. OF TAXA		7	2	6	8	5
SHANNON-WEAVER DIVERSITY		2.50	0.99	0.90	1.32	1.91
RICHNESS		2.08	0.12	0.58	0.83	1.10
EVENNESS		0.89	0.99	0.31	0.44	0.62

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	13-1	13-2	13-3	13-4	13-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						
Ophidonais serpentina						
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix		1	127		207	
L. clapparedianus		2				
L. hoffmeisteri		9			69	19
L. udekemianus		4	381		207	
Potamothrix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus		1				
Spirosperma ferox						
Tubifex ignotus						
T. tubifex		2		107	69	
immature with hair setae		18	6727	4938	3169	765
immature without hair setae		27	254	859	244	336
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata			1			
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.		1				
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.				1		
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1983

Taxa	Station No.	13-1	13-2	13-3	13-4	13-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paradiadelpia sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diametinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		5	1			18
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum			1			
M. transversum					2	
Sphaerium sp.						
Pisidium sp.			1			
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		70	7493	5905	4067	1138
NO. OF TAXA		8	7	3	5	3
SHANNON-WEAVER DIVERSITY		2.38	0.56	0.60	1.03	1.00
RICHNESS		1.65	0.67	0.23	0.48	0.28
EVENNESS		0.79	0.20	0.38	0.00	0.63

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	14-1	14-2	14-3	14-4	14-5
P. COELENTERATA						
Hydra sp.		1				1
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Styodrilus heringianus						
F. Naididae						
Arcteonais lomondi						
N. variabilis						
Ophidonaia serpentina						6
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobius						
A. plurisetus		15				67
Styodrilus templetoni						
Limnodrilus cervix			522	159		
L. clapparedianus		1				
L. hoffmeisteri		10	127	159	103	1
L. udekemianus		2	381	106		5
Potamothrix moldaviensis						
P. vejdovskyi						
Quistadrilus multisetosus						
Spirosperma ferox						
Tubifex ignotus						
T. tubifex			191	106		
immature with hair setae		4	2352	2557	2328	11
immature without hair setae		13	1081	53	672	8
Cl. Hirudinea						
F. Erpobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.		1				
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	14-1	14-2	14-3	14-4	14-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						4
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.		1				
Procladius sp.		3				16
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.					1	
Pisidium sp.						
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps		1				1
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		52	4704	3134	3104	120
NO. OF TAXA		10	4	4	3	9
SHANNON-WEAVER DIVERSITY		2.17	1.63	0.85	0.81	2.10
RICHNESS		2.28	0.35	0.37	0.25	1.67
EVENNESS		0.74	0.82	0.43	0.51	0.66

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	15-1	15-2	15-3	15-4	15-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Styodrilus heringianus						
F. Naididae						
Arcteonais lomondi						
N. variabilis						
Ophidionais serpentina						2
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix	330	233		27	6	
L. clapparedianus						
L. hoffmeisteri	127	29		7	1	
L. udekemianus	51	58			13	
Potamothrix moldaviensis						
P. vejdoskyi						
Quistadrilus multisetosus		19				
Spirosperma ferox	51	29		7	13	
Tubifex ignotus						
T. tubifex	25		60	34	1	
immature with hair setae	440	107	1424	263	27	
immature without hair setae	203	68	299	81	34	
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.				2		
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	15-1	15-2	15-3	15-4	15-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicrochironomus sp.						2
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		4	3		1	2
F. Chironomidae pupae sp. indet.						1
F. Ceratopogonidae						
Bezzia complex						1
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum		4	6			
M. transversum						
Sphaerium sp.		1				
Psidium sp.						1
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		1736	552	1783	422	104
NO. OF TAXA		8	8	2	6	11
SHANNON-WEAVER DIVERSITY		1.910	1.00	0.65	0.72	2.330
RICHNESS		1.07	1.07	0.72	0.72	2.33
EVENNESS		0.04	0.70	0.65	0.11	0.42

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	16-1	16-2	16-3	16-4	16-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						
Ophidionis serpentina						4
Ripistes parvula						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnophilus						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix			1139	361	1511	8
L. clapedianus						
L. hoffmeisteri	824					
L. udekemianus	1649					8
Potamothenix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma terox	824			361		20
Tubifex ignotus						
T. tubifex	11543		8351	722	1889	24
immature with hair setae	40349		10628	12645	8372	149
immature without hair setae	824		1898	8310		27
Cl. Hirudinea						
F. Erpobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						1
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	16-1	16-2	16-3	16-4	16-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						1
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.						2
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						2
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.						
Pisidium sp.					1	1
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		56063	22016	22399	11714	248
NO. OF TAXA		4	2	3	4	10
SHANNON-WEAVER DIVERSITY		0.49	0.58	1.07	0.56	1.50
RICHNESS		0.22	0.20	0.30	0.43	0.8
EVENNESS		0.21	0.29	0.68	0.28	0.12

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	17-1	17-2	17-3	17-4	17-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum		1				
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						2
Ophidonais serpentina						9
Ripistes parvita						3
Stylaria fossularis						9
S. lacustris						26
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Illyodrilus templetoni						
Limnodrilus cervix		1165	258			
L. claremontianus						
L. hoffmeisteri		227	258			3
L. udekemianus			516			3
Potamothenix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma ferox					459	
Tubifex ignotus						
T. tubifex		10871	8725	2486	2754	5
immature with hair setae		8930	5420	12429	18820	61
immature without hair setae		1553	516	829	4590	19
Cl. Hirudinea						
F. Erpobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						5
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	17-1	17-2	17-3	17-4	17-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						60
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						7
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.		1				15
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.						3
F. Chironomidae pupae sp. indet.						2
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.						
Pisidium sp.						1
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						1
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						1
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		23298	15743	15744	26623	235
NO. OF TAXA		5	4	2	3	17
SHANNON-WEAVER DIVERSITY		0.76	0.61	0.30	0.78	3.08
RICHNESS		0.50	0.41	0.21	0.29	3.11
EVENNESS		0.33	0.31	0.30	0.49	0.75

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	18-1	18-2	18-3	18-4	18-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						68
Ophidonais serpentina						47
Ripistes parvita						7
Stylaria fossularis						
S. lacustris						151
Uncinaxis uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix			230	650	390	
L. clapparedianus						
L. hoffmeisteri			230			4
L. udekemianus			230		195	
Potamothenix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma ferox	169				195	4
Tubifex ignotus						
T. tubifex	169	1612	2274	3903	25	
immature with hair setae	3802	11057	15322	6635	29	
immature without hair setae	846	461	650	585	25	
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						5
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	18-1	18-2	18-3	18-4	18-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						29
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						2
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						87
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		1	1			3
F. Chironomidae pupae sp. indet.						14
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.						
Pisidium sp.						1
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						1
H. trivolvis						
Gyraulus parvus						1
F. Physidae						
Physa gyrina						
Physa sp.						1
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		4992	13824	16896	11903	604
NO. OF TAXA		4	5	2	4	17
SHANNON-WEAVER DIVERSITY		0.86	0.55	0.39	0.69	3.0
RICHNESS		0.47	0.52	0.21	0.43	2.65
EVENNESS		0.43	0.21	0.39	0.34	0.71

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	19-1	19-2	19-3	19-4	19-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Styodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						
Ophidionais serpentina						4
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobius						
A. plurisetus						
Limnodrilus templetoni						
Limnodrilus cervix			130	99	400	32
L. clapparedianus						
L. hoffmeisteri			130		89	16
L. udekemianus					44	
Potamotheirus moldaviensis						
P. vejdovskyi						
Quistadrilus multisetosus						
Spirosperma ferox	78	260	98	445	16	
Tubifex ignotus						
T. tubifex	1483	3119	296	924	32	
immature with hair setae	2810	3639	4243	356	290	
immature without hair setae	156	1170	1184	356	592	
Cl. Hirudinea						
F. Eropodellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						7
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	19-1	19-2	19-3	19-4	19-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						2
Demicryptochironomus sp.						
Dicotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		3		3	12	1
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						1
M. transversum				1		
Sphaerium sp.				1		
Pisidium sp.						5
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						1
V. tricarinata						
TOTAL		4530	8448	5925	2636	959
NO. OF TAXA		4	4	6	6	11
SHANNON-WEAVER DIVERSITY		0.35	1.02	0.88	1.25	0.90
RICHNESS		0.48	0.44	0.60	0.76	0.60
EVENNESS		0.17	0.51	0.34	0.36	0.02

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	20-1	20-2	20-3	20-4	20-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbricidae						
Stylodrilus heringianus		19				
F. Naididae						
Arcteonais lomondi						
N. variabilis						24
Ophidonais serpentina		1				64
Ripistes parvita						
Stylaria fossularis						
S. lacustris						64
Uncinaxis uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix		89	5		23	20
L. clareidii			5	39		
L. hoffmeisteri			37	39	49	12
L. udekemianus						
Potamothenix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma ferox		312	32	232	122	8
Tubifex ignotus			11			
T. tubifex		45	139	1547	730	4
Immature with hair setae		848	22	22	511	40
Immature without hair setae		1428	53	387	292	131
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae			17		2	16
Asellus sp.						
O. Amphipoda						
F. Gammaridae						6
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						1
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	20-1	20-2	20-3	20-4	20-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.		1				
Cryptochironomus sp.		5				
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						7
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.		1				
S.F. Diamesinae						
Monodiamesa sp.		1				
S.F. Orthocladinae						
Cricotopus sp.						26
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		1	3	2	3	5
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum		3				1
Sphaerium sp.		7				
Pisidium sp.		6			5	4
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						1
Physella sp.						
F. Valvatidae						
Valvata sincera						2
V. tricarinata		1				
TOTAL		2768	329	2323	1787	436
NO. OF TAXA		14	8	5	7	17
SHANNON-WEAVER DIVERSITY		1.50	2.11	1.37	1.39	3.20
RICHNESS		1.77	1.38	0.65	0.93	2.80
EVENNESS		0.29	0.70	0.59	0.50	0.78

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No. 21-1	21-2	21-3	21-4	21-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.					
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.					
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa					
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stylodrilus heringianus					
F. Naididae					
Arcteonais lomondi					
N. variabilis					
Ophidonais serpentina	1	1			
Ripistes parvita					
Stylaria fossularis					
S. iacustris					
Uncinaria uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobioides					
A. plurisetus					
Ilyodrilus templetoni					
Limnodrilus cervix	1				
L. clapparedianus					
L. hoffmeisteri	10	11	1	44	1
L. udekemianus	1				
Potamothenix moldaviensis					2
P. vejovskyi					
Quistadrilus multisetosus					
Spirosperma ferox	15	25	3	6	2
Tubifex ignotus					
T. tubifex	26	12	1	151	1
Immature with hair setae	1	2	2	19	
Immature without hair setae	22	39	3	138	21
Cl. Hirudinea					
F. Eropobdellidae					
Dina sp.					
F. Glossiphoniidae					
Glossiphonia complanata					
Helobdella stagnalis					
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.	3	9		2	
O. Amphipoda					
F. Gammaridae					
Gammarus sp.		1			
Cl. Arachnida					
O. Hydracarina					
sp. indet.	1				
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.					
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.					

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	21-1	21-2	21-3	21-4	21-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.		1				
Cryptochironomus sp.			4			2
Demicrochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.				3	14	
S.F. Diamesinae						
Monodiamesa sp.						4
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		35	16		9	2
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum					2	
Sphaerium sp.		1				
Pisidium sp.		3	5		2	2
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa		1				
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		128	130	13	387	39
NO. OF TAXA		13	9	4	8	9
SHANNON-WEAVER DIVERSITY		2.64	2.48	1.99	3.0	2.50
RICHNESS		2.68	1.85	1.56	1.34	2.20
EVENNESS		0.71	0.78	0.99	0.51	0.95

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No. 22-1	22-2	22-3	22-4	22-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.					
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.					
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa				3	4
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stylodrilus heringianus	38				3
F. Naididae					
Arcteonais lomondi					
N. variabilis					
Ophidonais serpentina					
Ripistes parvita					
Stylaria fossularis					
S. lacustris					
Uncinaria uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobiis					
A. plurisetus				1	2
Ilyodrilus templetoni					1
Limnodrilus cervix					
L. clapparedianus					2
L. hoffmeisteri	1		115	15	7
L. udekemianus					
Potamothrix moldaviensis					
P. vejovskyi					
Quistadrilus multisetosus					
Spirosperma ferox	15		16	20	14
Tubifex ignotus			82	2	2
T. tubifex			41	1	
immature with hair setae	6		12	6	10
immature without hair setae			45	23	6
Cl. Hirudinea					
F. Eropodellidae					
Dina sp.					
F. Glossiphoniidae					
Glossiphonia complanata					
Helobdella stagnalis					
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.			3		1
O. Amphipoda					
F. Gammaridae					
Gammarus sp.					
Cl. Arachnida					
O. Hydracarina					
sp. indet.		1			
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.					
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.					

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	22-1	22-2	22-3	22-4	22-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.					2	
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.		1			2	2
Parachironomus sp.						
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.		5			2	3
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						1
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		2			4	2
F. Chironomidae pupae sp. indet.						2
F. Ceratopogonidae						
Bezzia complex		1				
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum				6		
Sphaerium sp.					1	
Pisidium sp.		1		1	1	11
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa				5		
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus				1		
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera				5		
V. tricarinata		1				4
TOTAL		71	1	332	83	77
NO. OF TAXA		10	1	10	12	17
SHANNON-WEAVER DIVERSITY		2.11	0	2.02	2.46	3.57
RICHNESS		2.35	—	1.72	2.72	3.0
EVENNESS		0.63	—	0.61	0.67	0.87

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No. 23-1	23-2	23-3	23-4	23-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.	2				
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.					
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa					
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stylodrilus heringianus					
F. Naididae					
Arcteonais lomondi					
N. variabilis					
Ophidonais serpentina	10				42
Ripistes parvita					
Stylaria fossularis					
S. lacustris	3				
Uncinaxis uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobius					
A. plurisetus					
Limnodrilus templetoni					
Limnodrilus cervix	27	425	66	205	10
L. clapparedianus					
L. hoffmeisteri	27	160		68	16
L. udekemianus		53			
Potamothrix moldaviensis					
P. vejovskyi					
Quistadrilus multisetosus					
Spirosperma ferox	19	53		205	26
Tubifex ignotus					
T. tubifex	38	272	758	273	5
immature with hair setae	675	2287	956	2662	192
immature without hair setae	270	266	165	683	42
Cl. Hirudinea					
F. Erpobdellidae					
Dina sp.	3				1
F. Glossiphoniidae					
Glossiphonia complanata	4				
Helobdella stagnalis	1				
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.	199				49
O. Amphipoda					
F. Gammaridae					
Gammarus sp.	10				
Cl. Arachnida					
O. Hydracarina					
sp. indet.	1				
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.	2				
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.					

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	23-1	23-2	23-3	23-4	23-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.		6				
Cryptochironomus sp.		1				1
Demicrochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.		7				1
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Abiaesmyia sp.						
Procladius sp.		17	20	5	3	1
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum					1	1
M. transversum				5		
Sphaerium sp.			1			
Pisidium sp.						
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa			2			
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera			2	1	1	2
V. tricarinata						
TOTAL		1422	3641	1956	4101	395
NO. OF TAXA		18	9	5	7	12
SHANNON-WEAVER DIVERSITY		2.16	1.27	0.58	1.25	2.22
RICHNESS		2.48	1.10	0.66	0.84	2.0
EVENNESS		0.52	0.40	0.25	0.45	0.82

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	24-1	24-2	24-3	24-4	24-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis		2				
Ophidonais serpentina		9				151
Ripistes parvita						40
Stylaria fossularis						
S. lacustris		2				64
Uncinaxis uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobius						
A. plurisetia						
Ilyodrilus templetoni						
Limnodrilus cervix			19			
L. clapparedianus						
L. hoffmeisteri		1				
L. udekemianus						
Potamothrix moldaviensis						
P. vejdovskyi						
Quistadrilus multisetosus						
Spirosperma ferox			19			
Tubifex ignotus						
T. tubifex					31	
immature with hair setae			1254	449	562	
immature without hair setae			112	84	31	
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						1
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.		5				47
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						1
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						2
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	24-1	24-2	24-3	24-4	24-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.		1				3.5
Paracladopelma sp.						
Paratamytarsus sp.						2
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.		1				3.8
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		2				
F. Chironomidae pupae sp. indet.						2
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.			1		3	
Pisidium sp.						1
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						1
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		23	1405	533	627	385
NO. OF TAXA		8	4	2	3	13
SHANNON-WEAVER DIVERSITY		2.52	0.56	0.63	0.33	2.52
RICHNESS		2.55	0.55	0.32	0.47	2.18
EVENNESS		0.84	0.28	0.63	0.21	0.65

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	25-1	25-2	25-3	25-4	25-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.					1	2
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Styodrilus heringianus			19			
F. Naididae						
Arctonais lomondi					2	
N. variabilis						
Ophidonais serpentina		30				
Ripistes parasita						
Stylaria fossularis						
S. lacustris		5				
Uncinaxis uncinata						3
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus			48		1	
Ilyodrilus templetoni						
Limnodrilus cervix			29	73		23
L. clapparedianus						
L. hoffmeisteri		274	19	156	2	17
L. udekemianus						
Potamothrix moldaviensis						
P. vejdovskyi						
Quistadrilus multisetosus			10	21		3
Spirosperma ferox		48	19	31	7	14
Tubifex ignotus			19	10		
T. tubifex			183	166		11
immature with hair setae		32	123	104	1	
immature without hair setae		597	144	135	6	46
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.		367	11	22		
O. Amphipoda						
F. Gammaridae						
Gammarus sp.		2			1	
Cl. Arachnida						
O. Hydracarina						
sp. indet.		1				
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	25-1	25-2	25-3	25-4	25-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.		9				
Cryptochironomus sp.			1	1		
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.		1				
Paracladopelma sp.					5	
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.			1			
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		42	35	24		2
F. Chironomidae pupae sp. indet.				1		
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum		14				
M. transversum						
Sphaerium sp.			4	11		
Pisidium sp.		72	3	7		
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa					1	
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera		2			2	1
V. tricarinata		1		1	2	
TOTAL		1497	718	763	31	133
NO. OF TAXA		15	14	13	11	9
SHANNON-WEAVER DIVERSITY		1.88	2.52	2.41	2.06	2.30
RICHNESS		2.05	2.13	1.96	3.20	5.0
EVENNESS		0.48	0.66	0.65	0.86	0.52

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	27-1	27-2	27-3	27-4	27-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stygodrilus heringianus						
F. Naididae						
Arcteonais lomondi						
N. variabilis						
Ophidonais serpentina						
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaxis uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobius						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix	290	145	115	497	22	
L. clapparedianus						
L. hoffmeisteri	193		77	191	67	
L. udekemianus						22
Potamothrix moldaviensis						
P. vejvodskyi						
Quistadrilus multisetosus						
Spirosperma ferox						
Tubifex ignotus						
T. tubifex		290	77	306	22	
immature with hair setae	4635	2624	1922	1032	1154	
immature without hair setae	386	579	77	229	89	
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.						1
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	27-1	27-2	27-3	27-4	27-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						1
Paracladopelma sp.						
Paratamytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						1
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.				1	2	12
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						2
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum						
Sphaerium sp.			3			1
Pisidium sp.					1	2
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						4
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						1
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		5504	8691	2269	2258	1401
NO. OF TAXA		3	3	4	5	13
SHANNON-WEAVER DIVERSITY		0.78	0.42	0.65	1.34	0.26
RICHNESS		0.25	0.33	0.52	0.65	0.20
EVENNESS		0.49	0.26	0.32	0.58	0.26

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No. 28-1	28-2	28-3	28-4	28-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.					
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.					
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa					
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stygodrilus heringianus					
F. Naididae					
Arcteonais lomondi					
N. variabilis					
Ophidonais serpentina		6			
Ripistes parasita					
Stylaria fossularis					
S. lacustris		1			
Uncinaxis uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobius					
A. plurisetia		1			
Ilyodrilus templetoni					
Limnodrilus cervix	20	1	4	28	50
L. claparedianus					
L. hoffmeisteri	39	1	38	28	99
L. udekemianus	7	4	8		
Potamothenix moldaviensis					
P. vejovskyi					
Quistadrilus multisetosus		1			
Spirosperma ferox	20	5		9	
Tubifex ignotus					
T. tubifex		1	26	47	50
Immature with hair setae	189	23	75	338	2776
Immature without hair setae	78	25	23	160	50
Cl. Hirudinea					
F. Eropobdellidae					
Dina sp.					
F. Glossiphoniidae					
Glossiphonia complanata					
Helobdella stagnalis					
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.	1	2			
O. Amphipoda					
F. Gammaridae					
Gammarus sp.					
Cl. Arachnida					
O. Hydracarina					
sp. indet.					
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.					
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.					

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	28-1	28-2	28-3	28-4	28-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.			1			
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		6	2		1	1
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						
M. transversum					1	
Sphaerium sp.						1
Pisidium sp.			1			
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina			1			
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		360	76	174	612	3027
NO. OF TAXA		7	14	4	6	5
SHANNON-WEAVER DIVERSITY		1.90	2.87	1.41	1.42	2.42
RICHNESS		1.19	2.23	0.78	0.94	0.62
EVENNESS		0.68	0.75	0.71	0.55	0.18

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	29-1	29-2	29-3	29-4	29-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stygodrilus heringianus						
F. Naididae						
Arctonais lomondi						
N. variabilis						
Ophidonais serpentina						5
Ripistes parvita						
Stylaria fossularis						
S. lacustris						
Uncinaria uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobius						
A. pluriset						
Ilyodrilus templetoni						
Limnodrilus cervix		23	42	22	7	3
L. clapparedianus						
L. hoffmeisteri			111		25	1
L. udekemianus						
Potamothenix moldaviensis						
P. vejovskyi						
Quistadrilus multisetosus						
Spirosperma ferox		2	28	5		7
Tubifex ignotus						
T. tubifex			153	38	28	
immature with hair setae		14	347	169	170	17
immature without hair setae		63	28	38	57	4
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.			1			2
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	29-1	29-2	29-3	29-4	29-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.			11	6	7	13
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						5
M. transversum			1			
Sphaerium sp.						
Pisidium sp.						
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		112	722	278	234	57
NO. OF TAXA		3	7	4	4	8
SHANNON-WEAVER DIVERSITY		0.67	1.38	1.02	1.42	2.68
RICHNESS		0.64	1.06	0.71	0.73	1.98
EVENNESS		0.42	0.49	0.51	0.71	0.89

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	30-1	30-2	30-3	30-4	30-5
P. COELENTERATA						
Hydra sp.						
P. PLATYHELMINTHES						
Cl. Turbellaria						
sp. indet.						
P. NEMERTEA						
Prostoma rubrum						
P. NEMATODA						
sp. indet.						
P. ANNELIDA						
Cl. Polychaeta						
Manayunkia speciosa						
Cl. Oligochaeta						
F. Glossoscolecidae						
sp. indet.						
F. Lumbriculidae						
Stylodrilus heringianus						
F. Naididae						
Arcteonais lomondi						
N. variabilis						
Ophidonais serpentina						
Ripistes parvita						
Stylaria fossularis						
S. jacustris						
Uncinaxis uncinata						
F. Tubificidae						
Aulodrilus americanus						
A. limnobioides						
A. plurisetus						
Ilyodrilus templetoni						
Limnodrilus cervix		24		1		
L. clapparedianus						
L. hoffmeisteri		47	15	2		20
L. udekemianus						7
Potamothenix moldaviensis						
P. vejdovskyi						
Quistadrilus multisetosus						
Spirosperma ferox		33	6	1		13
Tubifex ignotus						
T. tubifex			26	1		40
immature with hair setae		113	94	4		320
immature without hair setae		52	20	3		33
Cl. Hirudinea						
F. Eropobdellidae						
Dina sp.						
F. Glossiphoniidae						
Glossiphonia complanata						
Helobdella stagnalis						
P. ARTHROPODA						
Cl. Crustacea						
O. Isopoda						
F. Asellidae						
Asellus sp.			1			5
O. Amphipoda						
F. Gammaridae						
Gammarus sp.						
Cl. Arachnida						
O. Hydracarina						
sp. indet.						
O. Ephemeroptera						
F. Ephemeridae						
Hexagenia sp.						
F. Leptophlebiidae						
Leptophlebia sp.						
F. Caenidae						
Caenis sp.						
O. Hemiptera						
F. Corixidae sp. indet.						
O. Megaloptera						
F. Sialidae						
Sialis sp.						
O. Coleoptera						
F. Elmidae						
Dubiraphia sp.						
Optioservus sp.						

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	30-1	30-2	30-3	30-4	30-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.		1				
Cryptochironomus sp.						
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.						
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		47	68	2		6
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum		1	3			
M. transversum						
Sphaerium sp.			5			
Pisidium sp.			1	1		
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		318	239	15	0	494
NO. OF TAXA		7	8	6	0	6
SHANNON-WEAVER DIVERSITY		2.22	1.82	2.33	—	2.98
RICHNESS		1.21	1.46	2.22	—	2.95
EVENNESS		0.79	0.61	0.90	—	0.38

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No. 31-1	31-2	31-3	31-4	31-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.					
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.					
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa					
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stylodrilus heringianus		2	3	4	
F. Naididae					
Arcteonais lomondi					
N. variabilis					
Ophidonais serpentina					
Ripistes parvita					
Stylaria fossularis					
S. lacustris					
Uncinais uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobius					
A. pluriset		2			
Ilyodrilus templetoni					
Limnodrilus cervix					4
L. clapedianus					
L. hoffmeisteri		8	3	2	16
L. udekemianus		2			4
Potamothenix moldaviensis					
P. vejsovskyi					
Quistadrilus multisetosus					
Spirosperma ferox	2	14	1		24
Tubifex ignotus		2		2	11
T. tubifex		47	12	46	8
immature with hair setae	4	14	8	43	106
immature without hair setae	1	11	7	20	142
Cl. Hirudinea					
F. Eropobdellidae					
Dina sp.				1	
F. Glossiphoniidae					
Glossiphonia complanata					
Helobdella stagnalis					
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.		1		4	9
O. Amphipoda					
F. Gammaridae					
Gammarus sp.					
Cl. Arachnida					
O. Hydracarina					
sp. indet.					
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.					
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.		1			

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	31-1	31-2	31-3	31-4	31-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.						
Cryptochironomus sp.						
Demicrochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.						
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.		1				
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						1
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.			4	4	18	18
F. Chironomidae pupae sp. indet.						
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum						4
M. transversum						
Sphaerium sp.				1	3	4
Pisidium sp.						3
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		8	108	39	143	454
NO. OF TAXA		4	10	6	8	12
SHANNON-WEAVER DIVERSITY		1.75	2.11	1.89	1.93	2.38
RICHNESS		1.92	2.14	1.64	1.63	1.96
EVENNESS		0.88	0.63	0.73	0.61	0.66

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No. 32-1	32-2	32-3	32-4	32-5
P. COELENTERATA					
Hydra sp.					
P. PLATYHELMINTHES					
Cl. Turbellaria					
sp. indet.					
P. NEMERTEA					
Prostoma rubrum					
P. NEMATODA					
sp. indet.	1				
P. ANNELIDA					
Cl. Polychaeta					
Manayunkia speciosa					
Cl. Oligochaeta					
F. Glossoscolecidae					
sp. indet.					
F. Lumbriculidae					
Stylodrilus heringianus	14	90	1	75	10
F. Naididae					
Arctonais lomondi					
N. variabilis					
Ophidonais serpentina					
Ripistes parvula					
Stylaria fossularis					
S. lacustris					
Uncinaria uncinata					
F. Tubificidae					
Aulodrilus americanus					
A. limnobioides					
A. plurisetus	1				
Ilyodrilus templetoni					
Limnodrilus cervix					
L. clapparedianus					
L. hoffmeisteri	3	18		15	45
L. udekemianus					
Potamothrix moldaviensis					
P. vejovskyi					
Quistadrilus multisetosus					
Spirosperma ferox	13	5		2	15
Tubifex ignotus		50		12	24
T. tubifex		14		3	5
immature with hair setae	4			10	
immature without hair setae	4	45	1	83	29
Cl. Hirudinea					
F. Eropobdellidae					
Dina sp.	1	1			
F. Glossiphoniidae					
Glossiphonia complanata					
Helobdella stagnalis					
P. ARTHROPODA					
Cl. Crustacea					
O. Isopoda					
F. Asellidae					
Asellus sp.	3	3	1		2
O. Amphipoda					
F. Gammaridae					
Gammarus sp.					
Cl. Arachnida					
O. Hydracarina					
sp. indet.					
O. Ephemeroptera					
F. Ephemeridae					
Hexagenia sp.					
F. Leptophlebiidae					
Leptophlebia sp.					
F. Caenidae					
Caenis sp.					
O. Hemiptera					
F. Corixidae sp. indet.					
O. Megaloptera					
F. Sialidae					
Sialis sp.					
O. Coleoptera					
F. Elmidae					
Dubiraphia sp.					
Optioservus sp.					

TABLE 1: SPECIES AND DENSITIES (No./0.05 m²) OF BENTHIC INVERTEBRATES IN THE KAMINISTIKWIA RIVER, 1985

Taxa	Station No.	32-1	32-2	32-3	32-4	32-5
O. Trichoptera						
F. Leptoceridae						
Nectopsyche sp.						
F. Polycentropodidae						
Polycentropus sp.						
O. Diptera						
F. Chironomidae						
S.F. Chironominae						
Chironomus sp.		1				3
Cryptochironomus sp.					1	
Demicryptochironomus sp.						
Dicrotendipes sp.						
Harnischia sp.						
Parachironomus sp.						
Paracladopelma sp.		3				
Paratanytarsus sp.						
Phaenopsectra sp.						
Polypedilum sp.						
Tanytarsus sp.						
S.F. Diamesinae						
Monodiamesa sp.			2		1	
S.F. Orthocladinae						
Cricotopus sp.						
Heterotrissocladius sp.						
S.F. Tanypodinae						
Ablabesmyia sp.						
Procladius sp.		6	9			16
F. Chironomidae pupae sp. indet.			1			
F. Ceratopogonidae						
Bezzia complex						
P. MOLLUSCA						
Cl. Bivalvia						
F. Sphaeriidae						
Musculium partumeum		6				
M. transversum						
Sphaerium sp.						1
Pisidium sp.		1	2			2
Cl. Gastropoda						
F. Hydrobiidae						
Amnicola limosa						
F. Planorbidae						
Helisoma anceps						
H. trivolvis						
Gyraulus parvus						
F. Physidae						
Physa gyrina						
Physa sp.						
Physella sp.						
F. Valvatidae						
Valvata sincera						
V. tricarinata						
TOTAL		61	240	3	202	257
NO. OF TAXA		13	11	3	7	10
SHANNON-WEAVER DIVERSITY		3.15	2.30	1.58	.64	2.11
RICHNESS		3.16	2.01	2.73	.32	1.80
EVENNESS		0.85	0.67	1.00	0.58	0.63

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